POPULAR SCIENCE

Mar. 1948 · 25c

This Can Happen to YOU

PAGE 98

Here's Easy High-Speed Self-Instruction in all 25 Useful Branches of

Mathematics

to help you qualify for a bigger, better job in any business or industry!

Brought to You by 28 Leading Experts from Columbia, M.I.T., Cornell, Carnegie Tech., Georgia Tech., Many Others! The Simplified Streamlined Mathematics Course Used by Over 100,000 Men in Shop, Field and Office!

No One University Ever could Proclaim Such a Distinguished Group of Mathematicians!

GENERAL EDITOR—R. S. Kimball, Ed. D. Formerly instructor at N. Y. U. Nationally famous organizer of courses in Mathematics for War Service.

Mass. Inst. Technology
Norbert Wiener, Ph.D. Vice-Pres. American Mathematical Society. Bocher Prize Winner.

Columbia Univ.
Edw. Kasner, Ph.D. Member, Committee on Mathematics National Research Council.

Carnegie Inst. Tech.
Lloyd Lyne Dines, Ph.D. Head of Dept. of Mathematics.

Rensselaer Poly Inst.
James McGiffert, C.E., Ph.D. Member, Editorial Board National Mathematics Magazine.

Princeton Univ.
Norman J. Sollenberger, M.A. in C.E. Asst. Prof. of Civil Eng. Head of Materials Testing Laboratories.

Fordham University
Walter A. Hynes, Sc.D. Assoc. Prof. of Analytic Chemistry.

Northwestern Univ.
David Raymond Curtiss, Ph.D. President, Mathematical Association of America.

Stevens Inst. Tech.
Robert Baker, B.S. Asst. Director War Industries Training School.

Cornell Univ.
Ralph P. Agnew, Ph.D. Head of Mathematics Dept.

Univ. of Chicago
Lawrence M. Graves, Ph.D. Professor of Mathematics.

Georgia School Tech.
Ralph A. Hefner, Ph.D. Professor of Mathematics.

University of Notre Dame
Karl Menger, Ph.D. Prof. of Mathematics. Vice-President International Congress of Mathematics.
Paul M. Pepper, Ph.D. Assoc. Prof. of Mathematics.

University of Ill.
O. K. Bower, Ph.D. Asst. Prof. of Mathematics.

Pratt Institute
Otis Benedict, Jr.—Assoc. Prof. Machine Shop Practice.

Calif. Inst. of Tech.
William W. Michael, B.S. in C.E. Head of Dept. of Civil Engineering.
William H. Pickering, M.A. in E.E., Ph.D. Assoc. Prof. of Electrical Engineering.

U. S. Naval Academy
Sebastian B. Littauer, C.E., D. Sc. Formerly Instructor at Annapolis; Now on Engineering Staff, Bendix Radio.

R. C. A. Institutes
George F. Maedel, E.E. Chief Instructor N. Y. School of R.C.A. Institutes.

Univ. of Michigan
Carl H. Fischer, Ph.D.
C. J. Nesbitt, Ph.D. Asst. Prof. of Mathematics.

Univ. of Pennsylvania
Wharton School of Finance and Commerce.
Jeremiah Lockwood, Ph.D. Head of Accounting Dept.
Edward N. Wright, Ph.D. Assoc. Prof. of Accounting.
Oscar S. Nelson, Ph.D. Assoc. Prof. of Accounting.

Univ. of So. Calif.
Park J. Ewart, Ph.D. Head of Dept. of Finance.
Kenneth L. Trefftzs, Ph.D. Asst. Prof. of Finance.

Stanford Univ.
Vern James, Ph.D. Graduate School of Business.

Now Yours at an AMAZING BARGAIN in these Four Books!

Nearly 1300 Pages! Over 600 Helpful Pictures and Diagrams!

CLIMAXING its achievements in adult education, the NATIONAL EDUCATIONAL ALLIANCE offers you—at amazingly low cost—a new streamlined Course in Mathematics especially designed to answer the thousands of urgent calls from industry for mathematically trained men in virtually *every* field!

On work bench, in drafting room; in the laboratory; in tool die and pattern making; in construction and engineering of all kinds; there's hardly a field where a mathematically trained man hasn't a decided advantage. He gets the better job—bigger pay—wins promotion quickly—and enjoys greater security through all his earning years—even during periods of change.

This New N.E.A. Course in Mathematics makes it possible for the average person to acquire—*in only a few months*—a practical working knowledge of all 25 branches of mathematics and their practical applications. It comes to you complete in four volumes filled with illustrated, fascinating lessons designed for home study.

You receive instruction from 28 foremost instructors chosen from outstanding universities. Each instructor has been selected because of his special knowledge of a particular branch of mathematics and because of his ability to simplify and streamline his instructions.

The PRACTICAL MATHEMATICS Library

Give You a Solid Foundation for Greater Earnings Throughout Your Life—in Virtually Any Field!

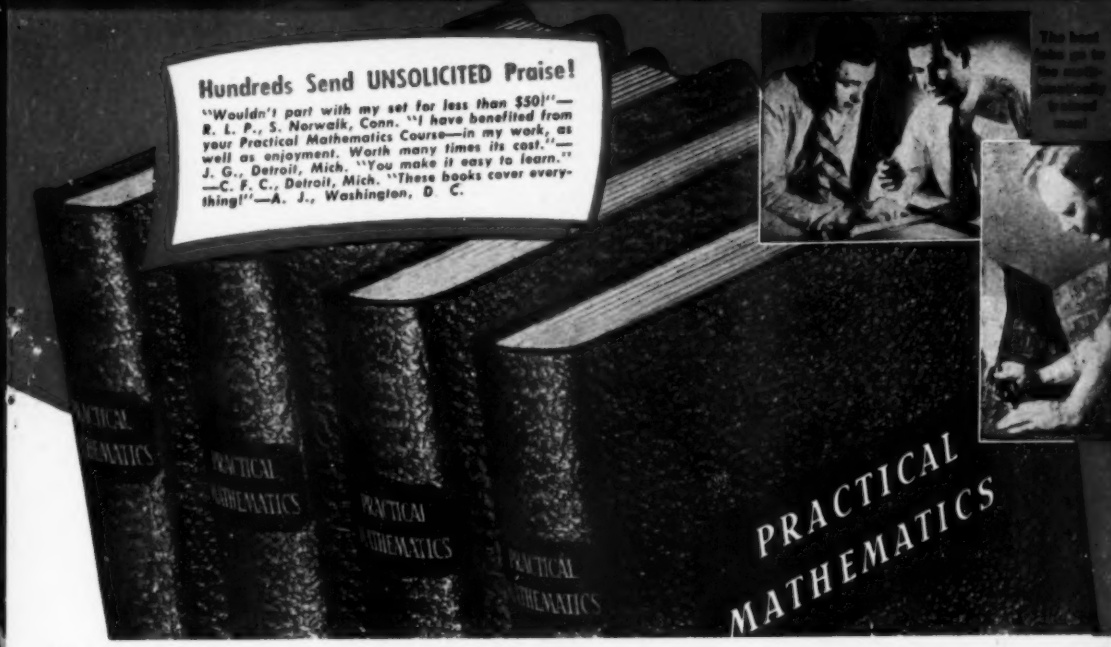
NO previous mathematics knowledge is needed under this ingenious teaching plan. You start with Basic Arithmetic and proceed by easy stages to an understanding of the most advanced branches of mathematics.

You learn how to use Algebra for short cuts in daily shop problems, in construction work, in tool and die making, in welding, sheet metal work and pattern making, in office and laboratory. You'll learn how to apply Geometry in chemistry, mechanics, electricity and radio, in the drafting room. You'll learn how to employ Trigonometry in gearing, lathe centers, blueprints, die punches, etc.; in range finding, aviation, navigation. You'll learn how to utilize Calculus in the design and production of ships, dams, bridges, motors. You'll learn Practical Application that you can use to win advancement and bigger pay.

(Continued on opposite page)

Self-test problems with answers prove your progress to your satisfaction at every step of the way!

MAIL THIS FREE-TRIAL FREE-GIFT COUPON



FREE! *This 160 Page Book Amazing Mathematical*

SHORT-CUT TO CORRECT ANSWERS

Contains Exactly the Same Invaluable Time and Labor Saving Logarithm Tables as Books Selling as High as $4.50.

This book of Logarithms is **the greatest short-cut ever devised** for quick and easy multiplying dividing and all other calculating. Easier to learn; gives answers quickly and far more accurately than any Slide Rule. A complete explanation of the use of logarithm tables is given. So simple you can grasp it and begin to apply it in a few minutes. Covers logs for all numbers to the 6th place; contains much additional information including a table of circular arcs. Invaluable for mechanics, scientists, businessmen, etc. **FREE** even if you return the Mathematics Library!

28 Foremost University Experts Bring You Easy Mastery Of All 25 Branches of Mathematics for Use in Every Field! Here's Partial List of Contents:

1. BASIC ARITHMETIC
Shop short-cuts, quick applications of addition, subtractions, etc.

2. ADVANCED ARITHMETIC
Percentages, fractions, ratio, rapid calculation.

3. BASIC ALGEBRA
Industrial and technical short-cuts; formulas, etc.

4. ADVANCED ALGEBRA
Practical use of simultaneous equations, graphs, etc.

5. PLANE GEOMETRY
How to measure angles, areas, distances, etc.

6. CONIC SECTIONS
Determining path of a shell, design of auto headlights, etc.

7. SOLID GEOMETRY
Interpreting blueprints, coordinate points in drawing, etc.

8. TRIGONOMETRY
Calculating distance; theodolites and sextants, Vernier scale, etc.

9. LOGARITHMS AND SLIDE RULE
Short-cut operations in engineering problems.

10. THE CALCULUS
Solves problems that can be solved in no other way.

11. DIFFERENTIAL EQUATIONS
Determining rate of disintegration of radio-active substances; population increase or decrease, etc.

12. MENSURATION
Measurement of angles; torque, density, tolerances, etc.

13. STRUCTURAL ENGINEERING
Producing a finished structure; stresses; equilibrium, etc.

14. MACHINE-SHOP PRACTICE
Computing cutting speeds for lathe, drill press, etc.

15. HEAT
Controlling heat, expansion, specific and latent heat, etc.

16. CHEMISTRY
Equations, decomposition, replacement, etc.

17. HISTORY OF MATHEMATICS
Pythagoras, Euclid, Archimedes, the genuises of today.

18. ELECTRICITY
Measurements; resistances; capacitance; time constants, etc.

19. MILITARY GUNNERY
Range-finding; direction; trajectory; variables, etc.

20. NAVIGATION AND AERIAL NAVIGATION
Plotting a course; Mercator chart, great-circle sailing, drift, etc.

21. RADIO AND TELEVISION
Amplifier stages, tank circuits, television and high frequency transmission, etc.

22. LIFE INSURANCE
Annuities; compound interest; mortality tables; dividends, etc.

23. ACCOUNTING
Debits and credits, discounts, sinking fund; profit and loss, etc.

24. FINANCE
Capital financing, chain discounts, bonds, etc.

25. BUSINESS STATISTICS
Business cycle, index numbers, flow-charts, etc.

THE ABOVE IS ONLY A SMALL FRACTION OF THE SUBJECTS COVERED!

Yours for FREE TRIAL

Normally, mathematical training as comprehensive as these 25-Courses-in-1 would cost you hundreds of dollars and years of study. Now you get it in these 4 volumes at a small fraction of the cost and time! Test this Course at our risk and expense. Mail coupon below—get the set for a week's FREE Examination. After a week you may return it and *owe nothing;* however, if you are thoroughly convinced that it can help you advance to bigger earnings, keep it at the incredible bargain price and easy terms shown in coupon. *But you must ACT NOW!* This edition is limited in quantity. There may not be enough to meet nation-wide demand. Avoid disappointment — mail Free-Trial Coupon NOW! National Educational Alliance, 37 W. 47th St., New York 19, N. Y.

TODAY →

FREE-TRIAL AND GIFT COUPON

National Educational Alliance Inc.,
37 West 47th Street, New York 19, N. Y.

DO NOT WRITE IN BOXES

Without obligation to me, ship me prepaid for a week's FREE examination the complete "PRACTICAL MATHEMATICS LIBRARY" in 4 volumes of 1280 pages. After one week's FREE TRIAL examination, I will either return the books and owe you nothing; or keep them and send you only $2 then and $2 a month until the bargain price of only $9.80, plus a few cents postage, is paid. 137

FREE GIFT!—Also ship me prepaid the 160-page book "6-PLACE LOGARITHMS" to keep entirely FREE *even if I return the set!* 803

SAVE COST OF 5 LB. SHIPMENT PLUS 30c CASH DISCOUNT. Send only $9.50 with this coupon as full payment. Same return privilege, full refund guaranteed.

MR.
MRS. _____
MISS (Print plainly in block letters)
ADDRESS _____
CITY & ZONE No. _____ STATE _____

☐ Check here if you prefer to examine luxurious De Luxe Edition in Genuine Morocco-Grained flexible Artcraft, beautifully embossed. Only $1 per volume extra. Same terms.

FOUNDED 1872

POPULAR SCIENCE

MECHANICS AND HANDICRAFT REG. U. S. PAT. OFF.

VOL. 152: NO. 3

EDITOR: Perry Githens

MANAGING EDITORS: Fred O. Newman, Volta Torrey. **ART EDITOR:** Howard C. Jensen.

MECHANICS & HANDICRAFT EDITORS: Harry Walton, Frank Rowsome, Jr.

ASSOCIATE EDITORS: Alden P. Armagnac, Devon Francis, Robert Gorman, Sheldon Gallager, Hartley E. Howe, Herbert Johansen, Martin Mann, John F. Stearns, R. P. Stevenson.

ART DIRECTOR: Harry Samuels. ART ASSOCIATES: Herbert Anthony, Eric Karminski, Jr., Saverio Rada, Frances Cooper (Production).

STAFF PHOTOGRAPHERS: W. W. Morris (Chief), Hubert Luckett.

WESTERN EDITOR: Andrew R. Boone (Los Angeles).

EDITORIAL ASSISTANTS: Mae G. Dyer (Assistant to the Editor), Julia Charnif, Carol Ennis, Charlotte Korch, Agnes T. Quille, Ruth Westphal.

PUBLISHER: Godfrey Hammond

CONTENTS FOR MARCH, 1948

Cover painting by Reynold Brown

Science News

Mineral Facts on File....108
Rocket "Locomotive" Hits 1,000 M.P.H. 120
Twin Light Beams Measure Heat....121
Body Can Take Heat that Boils Water....130
New Spray Fights Mites....155
$500 Buys a Real Planetarium....156

Science at Work

Gun-Range Lead Mining....109
Barrow Climbs a Hill....119
War Rockets for Lifesaving....125
How Wrinkleproof Is Your Suit?....131
Horn Honks Warning....137
Ties Tamped Tighter....155
Man-Made Blizzard Blows at 40° Below..158
U. S. Alchemists Make Gold....159
Invisible Light Talks....164

PS Features

Needle that Bounces....109
These Safecrackers Get Away with It....113
Rooftop Radar Rolls Up....121
New Furniture Saves Space....126
Peeking Inside Pipes....127
Atom Boss Designs Own Desk....128
Diesel Is Lightweight....137
New Derrick Has Long Stretch....138
Picks Up, Melts Snow....144
Gadget Grab Bag....146
New Microscope....157
New Pans from Old Planes....168
How Evaporation Steals Heat....226

Aviation

Picture of the Month.... 97
Cooling "Hot" Pilots....110
What's New in Aviation....122
He's a Flying Snowshooter....150

Automobiles

Good Driving Is a Habit.... 98
Big Stuff on the Move....108
Tiny Car Does Big Job....145
Auto Delivery Speeded....155
Corner Windows Improve Rear Vision....169
Gus and the Private-Eye Caper....170
Hints from the Model Garage....174
Two-Cycle Harley Shifts by Foot....176
Plane Tank Converted into Racer....178
Cracked Block Saved by Welding....231

Inventions

New Ideas from the Inventors....106
Japs Greet Midget Car....108
Orchards Get Smokeless Heat....154

Photography

Photo Ideas and Equipment....214

This mark in text indicates Trade Name.

Continued on page 4

Published monthly at 353 Fourth Avenue, New York 10, N. Y., by Popular Science Publishing Co., Inc. Godfrey Hammond, President and Treasurer; R. C. Wilson, Raymond J. Brown, Stephen P. Glennon, Vice-Presidents; F. W. Briggs, Secretary. Entered as second-class matter Dec. 28, 1918, at the Post Office at New York under the act of March 3, 1879; additional entry as second-class matter at Dayton, Ohio. Entered as second-class matter at the Post Office Department, Canada. Printed in U. S. A. Copyright, 1948, by Popular Science Publishing Co., Inc. All rights reserved in the United States, Great Britain, and in all countries participating in the International Copyright Convention and Pan-American Copyright Convention. Yearly subscriptions to United States, its possessions and Canada, $2.50; foreign countries, $3.50. Subscribers must notify us of change of address four weeks in advance of the next publication date. Be sure to give both old and new addresses, including zone numbers.

How to pass a genius

All of us can't be geniuses. But any ordinarily talented mortal can be a success—and that's more than some geniuses are.

Now, as in Æsop's time, the race doesn't always go to the one who potentially is the swiftest. The *trained* man has no trouble in passing the genius who hasn't improved his talents.

In good times and bad times, in every technical and business field, the *trained* man is worth a dozen untrained ones, no matter how gifted.

The International Correspondence Schools can't make you into a genius. For more than 56 years, however, I. C. S. has been helping its students to become *trained, successful leaders*—and it can do the same for you.

Mark your special interest on the coupon. Don't be like the unsuccessful genius who wastes his life in dreaming of what he intends to do. *Act* now!

INTERNATIONAL CORRESPONDENCE SCHOOLS ICS

BOX 7603-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Business and Academic Courses
- ☐ Accounting ☐ Advertising
- ☐ Arithmetic ☐ Bookkeeping
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Certified Public Accounting
- ☐ Commercial
- ☐ Commercial Art
- ☐ Cost Accounting
- ☐ Federal Tax
- ☐ First Year College
- ☐ Foremanship ☐ French
- ☐ Good English ☐ High School
- ☐ Higher Mathematics
- ☐ Motor Traffic ☐ Postal Service
- ☐ Salesmanship ☐ Secretarial
- ☐ Sign Lettering
- ☐ Spanish ☐ Stenography
- ☐ Traffic Management

Air Conditioning and Plumbing Courses
- ☐ Air Conditioning
- ☐ Heating ☐ Plumbing
- ☐ Refrigeration ☐ Steam Fitting

Chemistry Courses
- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Chemistry, Mfg. Iron & Steel
- ☐ Petroleum Refining ☐ Plastics
- ☐ Pulp and Paper Making

Civil Engineering, Architectural and Mining Courses
- ☐ Architecture
- ☐ Architectural Drafting
- ☐ Building Estimating
- ☐ Civil Engineering ☐ Coal Mining
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Lumber Dealer
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping

Communications Courses
- ☐ Electronics
- ☐ Practical Telephony
- ☐ Radio, General
- ☐ Radio Operating
- ☐ Radio Servicing
- ☐ Telegraph Engineering

Electrical Courses
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician
- ☐ Power House Electric
- ☐ Ship Electrician

Internal Combustion Engines Courses
- ☐ Auto Technician ☐ Aviation
- ☐ Diesel-Electric
- ☐ Diesel Engines ☐ Gas Engines

Mechanical Courses
- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting
- ☐ Flight Engineer
- ☐ Forging ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Metallurgy
- ☐ Machine Shop
- ☐ Machine Shop Inspection
- ☐ Mechanical Drafting
- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting ☐ Ship Fitting
- ☐ Tool Designing ☐ Toolmaking
- ☐ Welding—Gas and Electric

Railroad Courses
- ☐ Air Brake ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Railroad Section Foreman

Steam Engineering Courses
- ☐ Boilermaking
- ☐ Combustion Engineering
- ☐ Engine Running
- ☐ Marine Engineering
- ☐ Steam Electric ☐ Steam Engines

Textile Courses
- ☐ Cotton Manufacturing
- ☐ Rayon Weaving ☐ Textile Designing
- ☐ Woolen Manufacturing

Name_____ Home Address_____

City_____ State_____

Age_____ Present Position_____ Working Hours_____ A.M. to_____ P.M.

Special tuition rates to members of the Armed Forces. Special discount to World War II Veterans.
Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.

Every Car Needs SIMONIZ!

Only SIMONIZ gives your car such long lasting beauty and protection . . . so why try a substitute?

Simoniz "builds up" your car's beauty—makes the finish brighter with each application—keeps colors from fading—protects against damage by grit and airborne chemicals. It's easy to use Simoniz—just follow the simple directions. Get Simoniz for your car today!

Liquid Simoniz Kleener is wonderful for cleaning quickly new cars or finishes in average condition. *Paste* Simoniz Kleener works miracles in restoring the luster to dull cars. Then apply Simoniz to make that restored beauty last years longer.

THE SIMONIZ CO., CHICAGO 16, ILL.

Motorists Wise Use

SIMONIZ

TRADE MARK REG.

KEEPS ALL CARS NEW LOOKING

35-mm. Camera Challenges Your Skill....216
Automatic Ironer Dries Photos.....235

Mechanics & Shopcraft

Plastic Pins Make Invisible Welds.....187
Squaring Stock by Hand.....188
Scraper Readies Wood for Sanding.....191
Vise Grips Round Stock.....206
Grinding Thread Improves Chuck.....207
New Shop Ideas.....208
Glamp-On Lamps Light Work.....211
Clearance Measured from Flat.....213
Midget Scoops from Tobacco Cans.....230
Blowout Patch Useful as Tray.....231
Sander, Lacquer Wheel Aid Output.....234
Sardine Cans Hold Small Parts.....238
Opening Joints in Soil Pipes.....239

Home Mechanics & Handicraft

New Galvanizer from Home Shop.....105
Vane Shows Wind on Indoor Dial.....180
Storybook Birdhouse.....184
Handmade Miniatures You Can Wear....186
I'm Proud of My All-Thumbs Craftwork..194
Lighted Plastic Shows House Numbers..198
Lifeboat Converted to Schooner.....199
Snack Tray Combines Wood and Copper 200
Man-Size Ash Tray.....203
How to Remove Dents from Tubing.....207
Rotary Files Decorate Leather.....212
New Bracket Seats Ball Valve.....213
Jewel Box Has Music Movement.....228
Wallpapering Your Floor.....229
Cabins Clad in Aluminum.....230
Toggle Holds Loose Doorstep.....231
My Hobby Paid for Itself.....232
Closet Improves Attic.....236
Ivy Holder Built Like Lantern.....237
Watch Bracelet Made in Ivory.....239
Wire Clip Melted into Plastic.....240

Radio & Electricity

Coming—Radio that Was Shot from Gun 132
Radio Builds Railroads in the Sky.....140
Clocks Run by Fly Power.....165
Pocket Radio Doubles as Hearing Aid....220
New Resistors Open on Overload.....224
News in Electronics.....225
Mending Electrical Porcelain.....238

Departments

Letters 16
The Voice of Science..... 95
I'd Like to See Them Make.....112
Keeping the Home Shipshape.....192
What's Your Ingenuity Quotient?.....202
Aids to Modern Living.....204
New Tools.....210
Editorial Memo.....294

New argus 21 has new sight!

Compare!

See Further why Argus 21 is the Popular 35 mm.

F3.5 coated, color-corrected lens • Double-exposure guard • New, built-in flash synchronization • Accurate behind-the-lens shutter • Speeds from 1/10 to 1/200 • Lens detachable for use on enlarger • Automatic film-wind stop . . . All PLUS "Markfinder"

Built-in "Picture Frame" lets you see Faster...More...Exactly!

If ever there was a 35 mm. camera designed to make good pictures easier to take, Argus 21 is it. For only Argus 21 has the new, exclusive "Markfinder" sight.

One look through "Markfinder" tells the story. "Markfinder" actually frames the picture before you take it. Cross mark pin-points center of image immediately . . . a "must" on action shots. Guideline border enables you to eliminate tilting and cropping . . . costly errors when you use color. That why Argus 21 owners say, "Argus 21 with 'Markfinder' does things no other camera can do." Your favorite dealer has Argus 21 now. See it — sight through it today.

ARGUS, INCORPORATED • ANN ARBOR, MICH.

ONLY ARGUS HAS "Markfinder"

for Engineers Inventors Machinists

A Book That Shows You

3000 ILLUSTRATIONS and DESIGNS

OF MECHANICAL MOVEMENTS, DEVICES, CONTRIVANCES & DETAILS!

Every conceivable kind of mechanical motion and work is briefly explained and illustrated in this unusually helpful book. As far as known, the only work in existence which aims to provide side by side suggested sketches of the various methods in use for accomplishing any particular mechanical movement or work, in a form easily referred to. Every engineer, inventor or mechanic finds the need of devising, simplifying or improving some mechanical process or method. In doing this he has to rely on memory or experience. Here is a reference book of nearly 3000 MEANS AND METHODS for producing any kind of movement or work, classified and arranged for easy reference!

SUCH AS: Accumulators, Anti-friction, Ball and Socket, Bearings, Blowings, Brakes, Cams, Chain Gear, Chopping, Chucks, Circular Motions, Clutches, Conveying, Cranes, Cranks, Cutting Doors, Drilling, Eccentrics, Engines, Expanding, Filtering, Gears, Governors, Grips, Grinds, Heating, Hinges, Hydraulics, Indicators, Journals, Levers, Links, Lowerings, Lubricators, Measuring and Weighing, Mixing, Nozzles, Parallel Motions, Pipes, Pivots, Power Propulsion, Raising, Ratchets, Rotary Engines, Safety Appliances, Shafting, Signals, Slides, Sounds, Speed, Spindles, Springs, Starting, Striking, Swivels, Tanks, Traps, Turbines, Valves, Water Wheels, Winding, Wipers, etc.

If you work with machinery of any kind, you need this ENGINEERS' SKETCH BOOK by Thomas W. Barber—355 pages, durably printed and bound in cloth. Price **$2.98**

POTTERY MADE EASY

by John Wolfe Dougherty

Contrary to the widespread notion that pottery is too difficult and expensive as a home-hobby, this book shows how artistic pieces can be easily turned out—and with home made equipment! Every phase and process is clearly explained and illustrated in a straightforward "work-with-you" manner—from the mixing and wedging of the clay to the forming, decorating, finishing and glazing of the object. All methods are clearly described in detail—casting, modeling, pressing in molds, coil, sticking up with slabs, throwing on a wheel, etc. In addition, contour charts, illustrations and expert advice are offered to aid in the selection of projects illustrated or those of your own design. The most popular book on pottery. 180 pages; with glossary and bibliography ..... ONLY **$2.75**

METALCRAFT AND JEWELRY

by Emil F. Kronquist

The primary purpose of this book is to acquaint the reader with the metals and methods used by the craft worker—silver, brass and copper. This book gives complete and unusually clear instructions for making and designing beautiful jewelry, decorative and useful objects. Complete instructions, and designs for the making of: brooches, pins, rings, bracelets, chains, candlesticks, letter openers, desk sets, etc. Also include instructions on: Wire drawing and Wire Work—Soldering Stones & Metals—Hammered Work—Raised Work—Metal Coloring, etc. Little equipment is required and this hobby can easily be mastered by any careful worker. **$3**

Tools & How To Use Them

Complete instructions about the use and care of all up-to-date tools.

Contents: **1.** The Technique of Using Tools—**2.** Screws and Screw Drivers—**3.** How to Use a Hand Saw—**4.** How to Adjust and Use Planes—**5.** Drilling Holes in Wood—**6.** Wood Chisels and How to Use Them—**7.** Laying-out and Checking Operations—**8.** Smoothing and Finishing—**9.** The Right Way to Use a Glass Cutter—**10.** Sharpening Woodworking Tools—**11.** Drilling Holes in Metal and Other Materials—**12.** Hand Sawing Metals—**13.** Files and Filing—**14.** The Technique of Soft Soldering—**15.** Cutting Threads with Taps and Dies—**16.** Wrenches—**17.** Punches and Cold Chisels—**18.** Tools for Bending Metal and Cutting Sheet Metal. Just Published. 1948—352 Pages, 600 illustrations. Price **$3.00**

HANDBOOK OF DESIGNS and How to Use Them

by Gordon deLemos

A book packed with fascinating design ideas for every kind of work—Metal Tooling, Stencilling, Leathercraft, Pottery, Wood Carving, Block Printing, Plastic Decoration, Embroidery, etc.—and each design carefully selected to fit the use for which it is suggested. Thus the border for a metal tray will differ from the border for a button, belt buckle or wallet. 118 Big Pages—with hundreds of large full-size workable designs such as: Leaf Motifs, Flowers, Animals, Birds, Boats, Nursery Design, Rosette, Geometric Patterns; Monograms, Alphabets, Special Holiday Designs, etc. Also special sections on:—Stencils, Coloring, Tooling, etc. Just Published. Price **$2.50**

a Basic Book on Handicrafts

A Book That Tells You

The Working Procedure of 14 Handicrafts

AND INCLUDES OVER 200 MAKE-IT-YOURSELF PROJECTS

A gold mine of fun and craft instructions for both the beginner hobbyists and the expert. Here are more things to make and do than have ever before been crammed into a single volume at this low price. From an ash-tray to a breakfast-table-and-bench set, over 200 projects are explained, with tools and equipment needed, simplified working drawings, pictures and step by step directions that make it easy to turn out finished handicrafts that everyone will admire.

Each craft and each project COMPLETELY EXPLAINED in this BRAND NEW book—"A TREASURY OF HOBBIES AND CRAFTS" edited by Michael Estrin. There is a unique enjoyment in making something with your own hands. If you have made it yourself, it will give you more pleasure than anything like it that you can buy.

Costume Jewelry	Metal Vases	Plastic Craft	Wooden Toys	Book-Cases
Book Ends	Miniature Furniture	Portrait Drawing	Rings	and many, many
Soap Sculpture	Candy Dish	Whittling	Earrings	more things.
Leather Accessories	Basketry	Metal Craft	Pendants	PRICE
Albums	Photography	Model Railroading	Trays	**$1.98**
Letter Openers	Indoor Gardening	Magic	Wallets	
		Stuffed Dolls	Dog Leashes	

IT'S FUN TO BUILD THINGS

Make and Fix Things for Your Home

The simplified picture-directions in this book guide you through the ABC's of every basic step right to the finished job. So easy you can't go wrong. Clear, easy-to-understand, non-technical language and more than 500 pictures. Just one article you make—or one repair job you do—with the help of this book, can easily save you many times the cost of the entire volume. Packed with hundreds of practical projects, ideas and suggestions.

Partial List of Things to Make

Window Seats, Cupboards, Closet Fittings, Panels, Hideaways for the Family Silver, Boxes and Chests, Folding Screens, Benches, Magazine Racks, Coffee Tables, and other "furniture," Bookshelves, Trick Stuff (folding bar, secret compartment, etc.), Ideas for Desks, Dressing Tables, End Tables, Shelf Units. Plus information of all the tools and supplies needed, how to buy lumber, information on sawing, where to build, drawing your plans, also Painting and Finishing (Oil Stain, Shellac, Brushing Lacquer, etc.). **$1.50**

WOOD FINISHING AND PAINTING MADE EASY

by Ralph G. Waring

This helpful book answers every possible question encountered in the selection and application of suitable finishes to wood and metalwork, concisely and with absolute accuracy. Includes the most recent techniques and demonstrating the use of the most modern equipment. This book begins with a discussion of cabinet woods, with the preparation of cabinetwork for finishing. It then presents the problem of selecting and using stains and finishing materials; the application of intermediary coats of finish, fillers, puttying; fast-drying finishes, both lacquers and enamels; selection, use and care of sprayguns and other paint-shop equipment; the application of special finishes to wood and metal, furniture, toys, and boats; the use of bronze powders and metallic paints. Here is a veritable encyclopedia in 19 chapters, with more than 100 photographs. Beautifully Bound. Illustrated, 209 Pages. Glossary. Index. **$3.50**

GENERAL LEATHERCRAFT

Pleasant profitable hobby for making handsome and practical things in leather. This book gives full, simplified craft instructions with every page lavishly illustrated by photos, drawings, and dimensional work diagrams. PART I explains leather, manufacture, craft leather, tools and equipment, where and how to buy leather supplies. PART II shows all basic operations: how to use tools, prepare leather for embossing, tooling, flat modeling, lacing, etc. PART III gives step-by-step methods to make Key Cases, Belts, Wallets, Handbags, Picture Frames, Novelty Jewelry—a total of 35 projects. PART IV provides you with **17 PAGES** of full-size **Designs** and **Monograms**, for decorating your projects. **So popular, this book has had 12 printings.** 112 pages, 8½ x 11 inches. **$1.50**

GENERAL PLASTICS

by Raymond Cherry

Plastic—the miracle product of modern times—lends itself beautifully to the craftsman's art. This instructive book, for the beginner or adept hobbyist, contains **over 40 easy plastic projects** fully described and illustrated with start-to-finish working diagrams, drawings, and photos. Shows exactly how to design, lay out material, cut, bend, shape and finish attractive and useful items such as plastic Lamps, Vases, Tie Racks, Handbags, Jewelry, etc.—all simple to turn out, with this modern how-to-make-it book. 128 pages 7¾x10¼ inches. **Special $1.50**

HOBBY BOOK MART, Dept. PS-3, 120 Greenwich St., New York 6, N. Y.

Please send me the book or books I have checked below. If not satisfied, I can return for full refund.

( ) Engineer's Sketch Book $2.98
( ) A Handbook of Designs 2.50
( ) Pottery Made Easy 2.75
( ) Metalcraft and Jewelry 3.00
( ) Tools and How to Use Them 3.00
( ) A Treasury of Hobbies and Crafts 1.98
( ) It's Fun to Build Things 1.50
( ) Woodfinishing and Painting Made Easy 3.50
( ) General Leathercraft 1.50
( ) General Plastics .. 1.50
( ) Car Owner's Guide to Care and Repair 2.00
( ) Secrets of Magic . 1.00
( ) It's Fun to Draw . 1.00
( ) Civil Service Handbook 1.25

☐ I enclose $..... in full payment. Send books postpaid
☐ Send C.O.D. for $..... plus postage

NAME.....
ADDRESS.....
CITY & ZONE.....STATE.....

CAR OWNER'S GUIDE TO CARE AND REPAIR

by Walter Altschuler

A money and trouble saver for every autoist, loaded with hundreds of facts and hints. Just Published—for new cars or old. Only **$2.00**

SECRETS OF MAGIC

This book shows you how to master 186 TRICKS, STUNTS, MAGIC, with cards, coins, mind-reading, etc. ..... Only **$1.00**

IT'S FUN TO DRAW

Anyone who has learned to write can learn to draw. This book teaches the beginner from the first step to framing. Covers: Still Life, Landscape, Animals, Human Figure, Portraits, Lettering, Posters, Advertising Art, etc. ..... Only **$1.00**

CIVIL SERVICE HANDBOOK

How to go about getting a lifetime, well-paying government position. Full information on 50 different jobs, among them: post office, policeman, fireman, clerk, court attendant, draftsman, factory inspector, guard, janitor, nurse, engineer, electrician, etc. Price **$1.25**

How To Order: Fill out the convenient coupon, check the titles of the books you want and mail the order. If you send payment with order we pay all delivery charges—if C.O.D., plus few cents postage.

Money Back Guarantee: All books full library size, beautifully printed and hard cover bound. If, for any reason, not completely satisfied return books and get money back at once.

HOBBY BOOK MART, 120 Greenwich St., Dept. PS-3, New York 6, N. Y.

Accountancy Home-Study

made *interesting* and *practical* thru *problem method*

YOU know as well as we do that Accountancy fits many men for positions that pay three and five and ten thousand dollars a year—gives many other men unusual opportunity to start a profitable growing business of their own.

You probably realize also that the accounting profession faces the greatest opportunity it has ever had.

The only question is—just how practical is it for *you* to train yourself adequately in Accountancy through home study?

And the answer lies in the LaSalle Problem Method.

For this modern plan of training not only makes Accountancy study at home thoroughly practical but makes it interesting as well.

And here's how:

You Learn by Doing

Suppose it were your privilege every day to sit in conference with the auditor of your company or the head of a successful accounting firm. Suppose every day he were to lay before you in systematic order the various problems he is compelled to solve, and were to explain to you the principles by which he solves them. Suppose that one by one you were to work those problems out—returning to him every day for counsel and assistance—

Granted that privilege, surely your advancement would be far faster than that of the man who is compelled to pick up his knowledge by study of theory alone.

Under the LaSalle Problem Method you pursue, to all intents and purposes, that identical plan. You advance by solving problems.

Only—instead of having at your command the counsel of a single individual—one accountant—you have back of you the organized experience of a great business training institution, the authoritative findings of scores of able accounting specialists, the actual procedure of the most successful accountants.

Thus—instead of fumbling and blundering—you are coached in the solving of the very problems you must face in the higher accounting positions or in an accounting practice of your own. Step by step, you work them out for yourself—until, at the end of your training, you have the kind of ability and experience for which business is willing and glad to pay real money.

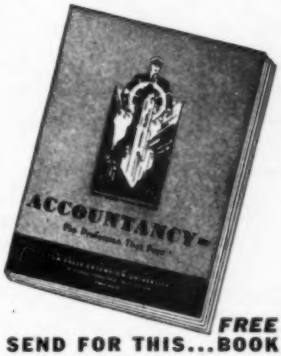
One-Tenth of All C. P. A.'s Are LaSalle Trained

If you want still more proof, remember that over 2300 C.P.A.'s—approximately one-tenth of all those in the United States who have passed the difficult examination for this coveted degree—are LaSalle alumni.

And knowing these facts, ask yourself if there can be any further question about the practicability of this training for you—ask rather if the real question is not about the size of your own ambition and the quality of your determination.

For Accountancy is no magic wand for the lazy or the fearful or the quitter—it offers success only to the alert adult who has the courage to face the facts and the will to carry on till the job is done.

If you are that individual, the coupon below, filled out and mailed, will bring you free the information that may open up to you the future of which you have dreamed — ability and income and success. Is it not worth getting that information?



SEND FOR THIS...FREE BOOK

LaSalle Extension University

A Correspondence Institution

Dept. 383-H 417 S. Dearborn St., Chicago 5, Ill.

Please send me, free of all cost or obligation, your 48-page illustrated book "Accountancy, the Profession That Pays," telling about the profession of accountancy and your training for success in that field.

Name.....

Address.....*City & Zone*.....

Position.....*Age*.....

Do You THINK in Circles?

Do you ask yourself, "How shall I begin; what shall I do next?" Have you a confusion of ideas? Mastery in life, success in any enterprise, comes from the subtle ability to marshal your thoughts, to call to the fore, when an emergency arises, the proper mental powers. Mentally, you are an aggregate of forces. Why dissipate them because of lack of knowledge of how to properly use them? Learn to unite them, and you will have at your command, a *tremendous power* for accomplishment.

SEND FOR FREE BOOK

The Rosicrucians have preserved for centuries knowledge of the secret method for the development of mind power and the direction of man's unused inner faculties. This wisdom, not strange or mysterious, has changed the course of life for many men and women throughout the world. Write for the free, sealed book which explains how you may obtain this helpful information. Address: Scribe E.T.E.

The **ROSICRUCIANS**
(AMORC)
SAN JOSE · CALIFORNIA
(Not a religious organization)

Scribe E.T.E. *The Rosicrucians,*
San Jose, California

Please send me a copy of the sealed booklet, "The Mastery of Life," which I shall read as directed. No representative will call.

Name _____

Address _____

City _____

AUDELS REFRIGERATION & AIR CONDITIONING GUIDE.....$4
Now from Cover to Cover—1250 Pages, Fully Illus. Covering basic principles, servicing, operation & repair of household, commercial & industrial refrigeration & air conditioning. A gold mine of essential important facts for engineers, servicemen, users.

AUDELS CARPENTERS & BUILDERS GUIDES—4 Vols. $6
A practical illustrated trade assistant on modern construction for carpenters, joiners, builders, mechanics and all woodworkers. 4 vols., 1600 pages, 3700 illustrations, flexible covers. Pocket size. Each volume sold separately $1.50 a vol.

AUDELS AUTOMOBILE GUIDE.....$4
A practical quick ready reference book for auto mechanics, service men, operators & owners. Explains theory, construction & servicing of modern motor cars, trucks, buses & auto type Diesel engines. 1700 pages, fully illustrated. 55 chapters. Indexed. A standard book for mechanics. New fluid drive covered.

AUDELS DIESEL ENGINE MANUAL..$2
A practical, concise treatise with questions and answers on the theory, operation and maintenance of modern diesel engines including General Motors 2 cycle Diesel. 384 pages, fully illus., flexible binding, pocket size. All details plainly brought out, this book is of extreme value to engineers, operators & students.

AUDELS WIRING DIAGRAMS.....$1
210 Pages. Illustrated. Gives practical facts on wiring of electrical apparatus. It shows clearly how to wire apparatus for practically all fields of electricity. Each diagram is complete & self-explanatory. Highly Endorsed Pocket Companion.

AUDELS PLUMBERS & STEAMFITTERS GUIDES—4 Vols. $6
A Practical Trade Assistant & Ready Reference. Explains in plain language & by clear illustrations, diagrams, charts, graphs, pictures principles of modern plumbing practice including Marine Pipe Fitting and Air Conditioning. 4 Vols.—1670 Pages—3642 Diagrams. Pocket size. Each Vol. Sold Separately $1.50 a Vol.

AUDELS SHEETMETAL WORKERS HANDY BOOK.....$1
Practical inside information. Fundamentals of Sheet Metal Work. 388 pages. Illustrated. 11 sections. Clearly written. Essential & important facts, figures, pointers in everyday language. Ref. Index.

AUDELS SHEETMETAL PATTERN LAYOUTS.....$4
Developed by Experts for Sheet Metal Workers, Layout Men & Mechanics. A Practical Encyclopedia in 10 Sections, size 7 x 10 x 2—1123 Pages—550 Layouts—1600 Illustrations. 1001 Key Facts. Fully indexed for ready reference in answering your layout problems. Covers all phases of sheet metal work including Pattern Cutting, Pattern Development & Shop Procedure.

AUDELS ANSWERS ON BLUE PRINT READING.....$2
For Mechanics & Builders. Covers all types of blue print reading including ship & airplane. 416 pages, fully illustrated.

AUDELS NEW MACHINIST & TOOLMAKERS HANDY BOOK.....$4
Covers modern machine shop practice in all its branches. 5 practical books in 1. New from cover to cover. Tells how to set up & operate lathes, screw and milling machines, shapers, drill presses and all other machine tools. 1600 pages, fully illustrated, 5 x 6½ x 2. Indexed. 5 sections. 1—Modern Machine Shop Practice. 2—Blue Print Reading & How to Draw. 3—Calculations & Mathematics for Machinists. 4—Shop Physics. 5—How to Use the Slide Rule. 60 chapters. Easy to read and understand. A shop companion that answers your questions.

AUDELS MATHEMATICS & CALCULATIONS FOR MECHANICS $2
Mathematics for home study or reference. 700 pages, 550 illus. Practical mathematics from beginning. How to figure correctly. Easy, correct methods covering complete review. Illus. & Indexed.

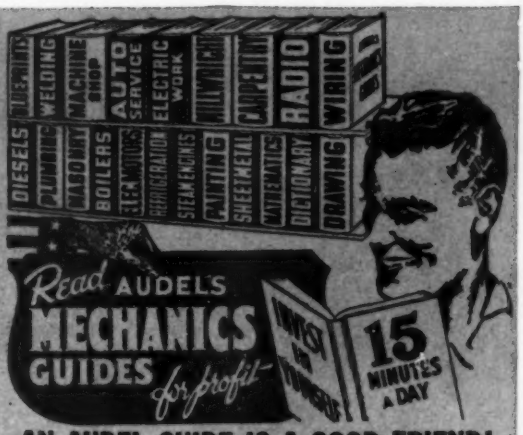
AUDELS HANDY BOOK OF PRACTICAL ELECTRICITY.....$4
For maintenance engineers, electricians & all electrical workers. 1440 Pages, 2600 Illus. Covers important electrical information in handy form—including Marine Wiring. Radio Principles, Welding. Indexed. A Key to a practical understanding of electricity.

AUDELS RADIOMANS GUIDE.....$4
A key to the practical understanding of radio including Frequency Modulation, Television, etc., Aircraft & Marine Radio. For radio engineers, servicemen, amateurs. 914 Pages, 633 Illustrations & Diagrams. Photos. Review Questions & Answers, Reference Index. Authentic, clear, concise.

AUDELS ELECTRONIC DEVICES.....$2
Tells What You Want to Know About Electric Eye. Easily Understood. Covers photo-electric cells & their applications. Amplifiers, illumination, frequencies, voltage, photocell, tubes, Ohm's Law, wiring diagrams, etc.

AUDELS WELDERS GUIDE.....$1
A concise, practical text on operation & maintenance of all welding machines for all mechanics. Over 400 pages, illustrated. Covers all methods of electric and acetylene welding including airplane work.

AUDEL, Publishers, 49 W. 23 St., N. Y. 10



AN AUDEL GUIDE IS A GOOD FRIEND!
Step Up Your Own Skill with the Practical Facts and Figures of Your Trade. Save time and money with right methods, short cuts, labor saving ideas. CHECK NOW! You can look over any Audel Guide in your home. Start the Easy Payments if satisfied.

CUT HERE

MAIL ORDER

THEO. AUDEL & CO., 49 W. 23 St., New York 10, N. Y.

Please mail me for 7 days' free examination the books marked (X) below. I agree to mail $1 in 7 days on each book or set ordered, and to further mail $1 a month on each book or set ordered until I have paid purchase price. If I am not satisfied with Guides I will return them.

☐ Audels ELECTRIC MOTOR GUIDE . . . . . $4.
☐ Audels OIL BURNER GUIDE . . . . . 1.
☐ Audels REFRIGERATION & Air Conditioning Guide . 4.
☐ Audels POWER PLANT ENGINEERS GUIDE . . . . 4.
☐ Audels PUMPS, HYDRAULICS & AIR COMPRESSORS 4.
☐ Audels WELDERS GUIDE . . . . . 1.
☐ Audels BLUE PRINT READING . . . . . 2.
☐ Audels SHEET METAL WORKERS Handy Book . . 1.
☐ Audels SHEET METAL PATTERN LAYOUTS . . . 4.
☐ Audels AIRCRAFT WORKER . . . . . 1.
☐ Audels MATHEMATICS and CALCULATIONS . . . 2.
☐ Audels MACHINISTS & TOOLMAKERS Handy Book 4.
☐ Audels MECHANICAL Dictionary . . . . . 4.
☐ Audels AUTOMOBILE GUIDE . . . . . 4.
☐ Audels DIESEL ENGINE MANUAL . . . . . 2.
☐ Audels MARINE ENGINEERS Handy Book . . . . 4.
☐ Audels MECHANICAL DRAWING GUIDE . . . . 1.
☐ Rogers MECHANICAL DRAWING and DESIGN . . . 2.
☐ Audels MILLWRIGHTS and Mechanics Guide . . . 4.
☐ Audels CARPENTERS and Builders Guides (4 vols.) . 6.
☐ Audels PLUMBERS and Steamfitters Guides (4 vols.) 6.
☐ Audels MASONS and Builders Guides (4 vols.) . . 6.
☐ Master PAINTER and DECORATOR . . . . . 2.
☐ Audels GARDENERS & GROWERS GUIDES (4 vols.) 6.
☐ Audels ENGINEERS & FIREMANS EXAMINATIONS 1.
☐ Audels ENGINEERS and Mechanics Guides Nos. 1, 2, 3, 4, 5, 6, 7 and 8 complete . . . . . 12.
☐ Audels Answers on Practical ENGINEERING . . . 1.
☐ Audels ELECTRICIANS EXAMINATIONS . . . . 1.
☐ Audels WIRING DIAGRAMS . . . . . 1.
☐ Audels Handy Book of PRACTICAL ELECTRICITY . 4.
☐ Audels ELECTRICAL POWER CALCULATIONS . . . 2.
☐ Audels ELECTRONIC DEVICES . . . . . 2.
☐ Audels ELECTRIC Dictionary . . . . . 2.
☐ Audels RADIOMANS GUIDE . . . . . 4.
☐ Audels NEW ELECTRIC LIBRARY at $1.50 a Volume Vols. I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII

Name _____

Address _____

Occupation _____

Employed by _____ PSM

How to build — repair—remodel your home . . .

How to do all kinds of wiring and installation jobs—*in accordance with the latest National Electrical Code*

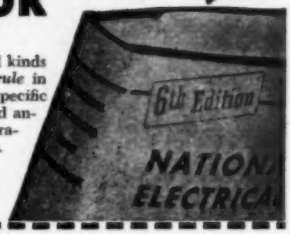
NATIONAL ELECTRICAL CODE HANDBOOK

By ARTHUR L. ABBOTT

Here is a book that shows you the right way to do all kinds of wiring jobs—quickly and easily. It explains *every rule* in the 1947 Electrical Code—tells *how to apply them* in specific situations. Saves delay—helps you avoid violations—and answers your questions on wiring motors, switches, generators, appliances, cable assemblies, transformers, etc.

633 pages
421 illus.

$4.00



CARPENTRY for the Building Trades

By ELBERT A. LAIR
Contractor, Builder, and Instructor

This helpful manual gives you complete details on how to handle every phase of carpentry work involved in housebuilding — framing, roofing, siding, blueprint reading, lumber ordering and estimating, etc. Fully illustrated, its step-by-step instructions provide sound guidance from the plan to the finished job. This is your key to better, quicker, more economical construction—in strict accordance with FHA requirements.

188 pages
147 illustrations
$2.50

SEND NO MONEY
SEE THESE BOOKS
10 DAYS
FREE

McGRAW-HILL BOOK CO., Inc., 330 W. 42nd St., NYC 18

Send me the book(s) checked below for 10 days' examination on approval. In 10 days I will remit for the books or return them postpaid. (Postage paid on cash orders.)

☐ **Abbott's National Electrical Code Handbook, $4.00**
☐ **Lair's Carpentry for the Building Trades, $2.50**

Name.....

Address.....

City and State.....

Company.....

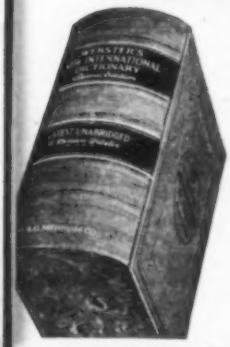
Position..... PSM-3-48

(For Canadian price, write McGraw-Hill Co. of Canada Ltd., 12 Richmond Street E., Toronto, 1.)

"The Supreme Authority"

in courts, schools, homes, newspapers and Government offices

The Merriam-WEBSTER



You may have had to wait for a copy of WEBSTER'S NEW INTERNATIONAL DICTIONARY, Second Edition. However, more and more copies are reaching your dealer. See him now. The MERRIAM-Webster contains 3,350 pages, illustrations for 12,000 terms, and a total of 600,000 entries—122,000 more than any other dictionary. It is the only unabridged dictionary completely revised and rewritten in three decades. G. & C. Merriam Co., Springfield 2, Mass.

Buy Give-a-Book Certificates at Your Bookseller

WEBSTER'S NEW INTERNATIONAL DICTIONARY • Second Edition

Do you want

→ **. . to go to College?**

→ **. . or to enter a Profession?**

(Such as Accounting, Architecture, Nursing, Dentistry, Teaching, Social Work, Osteopathy, Beauty Culture, Optometry, Embalming, Chiropody, Law, Medicine, etc.)

→ **. . or get an Office Position?**

To get anywhere, you practically MUST finish High School FIRST. You can complete our simplified High School Course in SPARE time at home, as FAST as your time and abilities permit. Equivalent to resident school work—prepares you for college, pre-professional examinations, business, industry. Standard texts furnished. Diploma. Credit for H.S. subjects already completed. Single subjects if desired. Low tuition, easy terms. American School, Chicago, est. 1897—endorsed by educators. Finish your high school education NOW. Write TODAY!

High School Course at Home

Many Finish in 2 Years

American School, Dept. H346, Drexel Ave. at 58th St., Chicago 37

Gentlemen: Send me FREE information covering special training in subjects checked below. No obligation on my part.

- ☐ High School Course
- ☐ Electronics, Industrial
- ☐ Architecture and Building
- ☐ Automotive Engineering
- ☐ Business Management
- ☐ Electrical Engineering
- ☐ Elec. and Gas Refrigeration
- ☐ Air Conditioning
- ☐ Railway Training
- ☐ Diesel Engineering
- ☐ Drafting and Design for Men and Women
- ☐ Plastics
- ☐ Private Secretary
- ☐ Mechanical Engineering
- ☐ Aviation
- ☐ Salesmanship
- ☐ Radio

Name.....

Address.....

Learn RADIO

IN A FEW SHORT WEEKS

IN THE GREAT SHOPS OF COYNE

48 Years of Successful Training

Work on Actual Radio, Sound, Television Equipment! Expert Instructors Train You by Famous COYNE SHOP METHOD

Get ready quickly for YOUR FUTURE. Big opportunities are waiting for properly trained men in Radio Manufacturing, Radio Sales and Service, Television, Sound, Public Address. With COYNE "All Around" Training, many branches of Radio are open to you.

NOT A "HOME-STUDY" COURSE

B. W. COOKE

Learn Radio Fast!

As a **Coyne** student you work on real equipment in our great shops in Chicago — the Radio Center of the World. We do not teach by mail. All **Coyne** training is given right here in our big Shops in Chicago. You make rapid progress at **Coyne** because it's a shop course.

COYNE GRADUATES IN DEMAND

Whether you have had any actual Radio experience or not, we can train you in a few weeks for a better job, steady work and a real future in the Radio field. First we train you for a good Radio job, then help you get it. **Coyne** graduates may use our **Lifetime Employment Service** as often as they wish.

Easy to Start Own Shop

If your ambition is to be your own boss, COYNE makes it easy! We include special training in how to start your own Radio Shop, how to get business, keep records, etc., right along with our course. Then we have Free Merchandising Service for graduates to solve many problems.

We'll Finance Your Training

Non-veterans who are short of cash can finance most of their tuition and pay it in easy monthly payments after graduation. You may earn while learning, to help defray living expenses. COYNE works with you to enable you to get the training you need.

VETERANS!

Coyne is authorized to train those who qualify under the G. I. Bill of Rights.

Physical Disabilities

Men with physical disabilities may qualify for training at no cost for tuition and subsistence. Coupon brings details.

SEND FOR BIG FREE BOOK!

Our new, fully illustrated **Coyne** Radio Book tells all about our great Chicago shops and our plans to help you. Packed with facts and pictures. No salesman will call. No obligation.

ADDED TRAINING

ELECTRIC REFRIGERATION

This valuable training now included with our Radio course.

B. W. COOKE, President,

COYNE ELECTRICAL AND RADIO SCHOOL
500 S. Paulina Street
Dept. 38-4H, Chicago 12, Ill.
ESTABLISHED 1899

MAIL FOR BIG *Free* BOOK

B. W. COOKE, Pres.,
Coyne Electrical & Radio School
500 S. Paulina St., Dept. 38-4H, Chicago 12, Ill.

Dear Mr. Cooke: Send me your Big Free Radio Book and all the facts . . . also full details of your "Student Finance" plan.

NAME.....

ADDRESS.....

CITY.....STATE.....

WAR SURPLUS OPTICAL BARGAINS

ASSEMBLE YOUR OWN BINOCULARS!
Complete Optics! Complete Metal Parts!
Save More Than ½ Regular Cost

GOVERNMENT'S 7x50 BINOCULARS

Complete Optics, new and ready for assembly. We supply full instructions. Limit—1 Set of Metal Parts and 1 Set of Optics to a customer.

METAL PARTS—Set includes all Metal Parts—completely finished—for assembly of 7 X 50 Binoculars. No machining required. Bodies have been factory hinged and covered. A sturdy Binocular Carrying Case is optional with each set of Metal Parts.
Stock #842-N **$39.40**
Postpaid, plus $4.80 for Case—**Total** **$44.20**

OPTICS—Set includes all Lenses and Prisms you need for assembling 7 X 50 Binoculars. These are in excellent condition—perfect or near-perfect—and have new low reflection coating.
Stock #8102-N ..... **$25.00 Postpaid**

NOTICE! If you buy both Binocular Optics and Binocular Metal Parts, add 20% Federal Excise Tax to above prices.

ARMY'S 6x30 BINOCULARS

No carrying Case with any Sets shown below. M-13A1 sets are waterproof model. M-3 sets are not waterproof.

COMPLETE OPTICS & METAL PARTS—Model M-13A1, 6 x 30 Binoculars. Everything you need—ready for assembly. When finished will look like a regular factory job costing $102 to $120. The Optics are new, in perfect or near-perfect condition. Have new low reflection coating. Metal Parts are new and perfect, all completely finished. No machining required. Bodies factory hinged and covered. Complete assembly instructions included.
Stock #830-N ..... **$40.00 Postpaid, plus $8.00 tax—Total—$48.00**

METAL PARTS ONLY—Model M-13A1, 6 x 30 Binoculars. No Optics. Same Metal Parts as described for Stock #830-N.
Stock #832-N—6 x 30 Metal Parts ..... **$25.00 Postpaid**

OPTICS FOR 6 x 30 BINOCULARS (No Metal Parts.) Perfect, and low reflection coated. **Stock #5130-N** .. **$15.00 Postpaid**

SAME OPTICS AS ABOVE (6 x 30) Coated—but slight seconds.
Stock #8124-N ..... **$12.75 Postpaid**

If you buy both Binocular Optics and Binocular Metal Parts, add 20% Federal Excise Tax to above prices.

Optics and Metal Parts are Available for Monoculars (½ a Binocular). For Complete Details, Write for Bulletin #14-N.

SIMPLE LENS KIT—Some gov't surplus, some commercial surplus, some chipped rejects, some perfect, few coated . . . in any event an excellent bargain. Containing Plano Convex, Double Convex, Concave, Miniscus Lenses. Dia. range 5mm to 40mm. Assorted focal lengths.
Stock #5-N ..... 45 lenses ..... **$ 5.00 Postpaid**
Stock #10-N ..... 80 lenses ..... **$10.00 Postpaid**

6 POWER GALILEAN TELESCOPE

(Commercial Surplus) 28mm dia. Achromatic Objective Lens. Sturdily constructed of Aluminum. 7" long, extends to 9". Complete with carrying case.
Stock #941-N ..... **$3.00 Postpaid**

POLARIZING VARIABLE DENSITY ATTACHMENT FOR BINOCULARS

An amazingly effective unit for controlling amount of light reaching your eyes. Cuts down glare in sky and overwater observations. Easily snapped on and off over the eye cups of American-made 7x50 Binoculars. Govt. cost $8.30 each.
Stock #20,000-N ..... **$2.00 Postpaid**

Above Polarizing Attachment also adaptable to Govt. 6 x 30 Binoculars with substitution of special Eye-cups.
Stock #20,010-N ....6 x 30 Eye-cups.... **75¢ pr. Postpaid**

NEVER HAS THERE BEEN SUCH A SENSATIONAL BARGAIN AS THIS!

BUBBLE SEXTANT

These Army Air Forces Bubble Sextants cost the Govt. about $125.00 each. A real bargain at our price of $12.50! Included with Bubble Sextant shipment is wooden Carrying Case, 5 spare waxed paper discs, flashlight with rheostat for night use (uses ordinary flashlight cells—not furnished) aux. 2-power Galilean Telescope, Allen wrench, 1 spare marking point. Wartime used. **BUT COMPLETELY REPAIRED, COLLIMATED AND PUT IN GOOD WORKING ORDER.** If not satisfied that Sextant is exactly as represented, return within 10 days and money will be refunded. Full directions for use accompany each shipment.
Stock #924-N ..... **$12.50 Postpaid**

Same Sextant as above, but **BRAND NEW** and with Automatic Electric Averaging Device and Illuminated Averaging Disc for nighttime use. Govt. cost $217. Though brand new we have re-checked Bubble and Collimation and GUARANTEE perfect working order.
Stock #933-N ..... **$22.50 Postpaid**

CONDENSING LENSES—Seconds, but suitable for Enlargers and Spotlights.
Stock #1061-N .....6½" dia., 9" F.L. ..... **$2.50 Postpaid**
Stock #1082-N .....4½" dia., 5½" F.L. ..... **70¢ Postpaid**

We Have a Limited Quantity of Condensing Lenses—seconds—ranging from 4½" to 8½" in dia. with various focal lengths. Send for Free Bulletin titled **"MISCELLANEOUS CONDENSING LENSES—N"**

$200.00 DRIFT METER for $4.95

These were used for determination of drift and true air speed. You can adapt to other uses or take apart to get 2 mounted Achromatic Lenses—Mirrors—Field Lens—Pantograph—Engraved Scales—Sponge Rubber Discs—metal parts and other components. Instrument weighs 4 lbs.
Stock 936-N ..... **$4.95 f.o.b. Chicago, Ill.**
(Shipping weight 12½ lbs.)

LENS CLEANING TISSUE—1st quality, sheet size 11" x 7½". Made to Govt. specs. Won't dust. Free of abrasives and lint.
Stock #721-N ..... 500 sheets ..... **$1.00 Postpaid**

SCHMIDT OPTICAL SYSTEM. Black plastic body, size 3 15/16" by 5½". F.L. 2.4" . . . . . with amazing speed of F.O.9. Used in Navy's Infra-Red Sniperscope and Signalling Units. Govt. cost $134.
Stock #720-N ..... **$6.00 Postpaid**

AIR FORCES GUN SIGHT—With Polarizing Variable Density Attachment. (Polarizing attachment alone is worth many times the price of entire unit.)
Stock #908-N ..... **$5.00 Postpaid**

Same Unit Without Polarizing Attachment
Stock #916-N ..... **$2.50 Postpaid**

35 MM KODACHROME PROJECTING LENS SET—Consists of Achromatic Lens for projecting, plus a Condensing Lens and piece of Heat Absorbing Glass with directions.
Stock #4025-N ..... **$1.95 Postpaid**

MOUNTED PROJECTING LENS SYSTEM

F.L. 91.44 mm. (just right for 35 mm. Projectors). Speed of F 1.9. Outside dia. of mount at one end 60 mm. Length of mount 64 mm.
Stock #4033-N ..... **$3.00 Postpaid**
THREADED OUTSIDE MOUNT FOR FOCUSING ABOVE SYSTEM (Not Illus.)—
Stock #715-N ..... **$1.00 Postpaid**

CONDENSING LENS SET—Consists of 2 Condensing Lenses with diameter of 2". Used for making 35mm projectors or many other purposes.
Stock 4034-N ..... **75c Postpaid**

We have literally millions of war surplus lenses and prisms for sale at bargain prices. Write for Catalog "N"—Sent Free!

SATISFACTION GUARANTEED • ***Order by Stock No.***

EDMUND SALVAGE CO., P. O. Audubon, New Jersey

Which of these books do you need in your hobby?

Here's how to get more fun and profit from your hobby. Each of the books described below is a detailed, step-by-step, illustrated guide, filled with expert advice and information.

CHECK YOUR CHOICE, THEN EXAMINE THEM 10 DAYS FREE

1. **WOODWORKING AS A HOBBY**
By Emanuele Stieri. A complete bench manual of all methods of home woodworking, design, construction, and care and use of tools. *Illustrated.* $3.00

2. **HANDICRAFTS AS A HOBBY**
By Robert E. Dodds. An excellent omnibus of exciting new crafts for home-workers, teachers, counsellors, playgrounds, and youth organizations. *Illustrated.* $2.00

3. **THE HANDYMAN'S HANDBOOK**
By C. T. Schaefer. Simple, concise information and directions for working on wood, metal, electrical appliances, and plumbing. *Illus.* $1.95

4. **FREEHAND DRAWING SELF-TAUGHT**
By Arthur L. Guptill. A popular manual both for those who want to draw for fun or commercially. By a noted teacher of art. *Illustrated.* $4.00

5. **WOOD-CARVING AS A HOBBY**
By Herbert W. Faulkner. Complete guidance for the beginner on how to use tools, select woods and patterns, and how to produce the various styles of carving. *Illustrated.* $2.00

6. **COMPLETE INTRODUCTION TO PHOTOGRAPHY**
By J. Harris Gable. Full information for the beginner, from taking simple snapshots to producing your own movies in color. *Illustrated.* $3.00

7. **PRACTICAL WOOD-CARVING PROJECTS**
By Enid Bell. Describes 22 specific projects, and suggests many more which can be undertaken in the home, club, or hobby group. *Illustrated.* $2.00

8. **THE ROYAL ROAD TO CARD MAGIC**
By Jean Hugard and Frederick Braue. Step-by-step instructions from the very simple manipulations to the more complicated sleight-of-hand card tricks. *Illustrated.* $4.00

9. **MODEL RAILROAD ENGINEERING**
By David Marshall. Comprehensive, practical information to help you lay out, construct and operate a model system. *Illustrated.* $3.50

10. **SKETCHING AS A HOBBY**
By Arthur L. Guptill. An invaluable handbook in which each step is accompanied by graphic, easily followed instructions and diagrams. *Illustrated.* $2.00

11. **PHOTOGRAPHY AS A HOBBY**
By Fred B. Barton. How to take good pictures, develop and print them *without investing much money.* *Illustrated.* $2.00

12. **PAINTING AS A HOBBY**
By Stephen B. Bach. A beginner's manual with graphic instruction and fundamental steps in using oils and watercolors. *Illustrated.* $1.75

13. **MODERN MAGIC MANUAL**
By Jean Hugard. Professional magic for fun and profit. Many tricks revealed for the first time. *Illustrated.* $3.50

14. **LEATHERCRAFT AS A HOBBY**
By Clifford Pyle. Sifts from the multitude of facts about leather only those essential to producing leather goods worthy of the time and expense put into them. *Illustrated.* $1.75

15. **POTTERY: Its Craftsmanship and its Appreciation**
By Edmund de Forest Curtis. More than a workshop manual, it supplies interesting data on historical trends, museum pieces and methods of appreciation. *Illustrated.* $2.00

16. **TIN-CRAFT AS A HOBBY**
By Enid Bell. How to make useful and decorative articles easily, just by starting with some tin cans, a hammer and nails. *Illustrated.* $2.00

17. **CREATING JEWELRY—For Fun and Profit**
By Andrew Dragunas. A how-to-do-it manual supplemented with over 50 diagrams which demonstrate the tools and how to use them. *Illustrated.* $3.00

18. **SILK SCREEN STENCIL CRAFT AS A HOBBY**
By J. I. Biegelsen. How with less than $5.00 worth of equipment, an amateur can produce extraordinary artistic effects in designing lampshades, posters, greeting cards, etc. *Illustrated.* $2.50

19. **DRAWING PEOPLE FOR FUN**
By Roger Vernam. Step-by-step instructions on the drawing of the human figure by the use of one basic model. *Illustrated.* $3.50

10 DAYS' FREE EXAMINATION

Simply check the numbers of the books you want on the coupon below, and we will send them. Examine them free for 10 days. Mail the coupon NOW.

HARPER & BROTHERS, 51 E. 33rd St., New York 16

Gentlemen: Please send me the following book(s) for 10 days' FREE examination. Within that time I will remit the list price of each, plus a few cents to cover mailing, or return the book(s) postpaid.

#1 ☐ $3.00	# 6 ☐ $3.00	#11 ☐ $2.00	#16 ☐ $2.00
#2 ☐ $2.00	# 7 ☐ $2.00	#12 ☐ $1.75	#17 ☐ $3.00
#3 ☐ $1.95	# 8 ☐ $4.00	#13 ☐ $3.50	#18 ☐ $2.50
#4 ☐ $4.00	# 9 ☐ $3.50	#14 ☐ $1.75	#19 ☐ $3.50
#5 ☐ $2.00	#10 ☐ $2.00	#15 ☐ $2.00	

Name_____

Address_____

City_____ Zone____ State_____ 6000

SAVE! If you enclose payment, publisher will pay mailing costs. Return privilege guaranteed.

GET THESE 2 BIG BOOKS FREE..

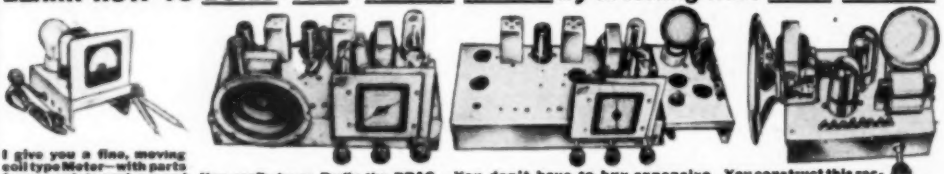
IF YOU WANT TO LEARN RADIO!

I Train You RIGHT by Sending You 8 BIG KITS of Radio Equipment *including* A POWERFUL 6 TUBE SUPERHET RECEIVER *and* 16 RANGE TEST METER!

FRANK L. SPRAYBERRY
famous Radio teacher of hundreds of successful Radio men.

Find out NOW how Sprayberry Training prepares you for a Radio Service Business of your own — or a good pay Radio job. Just mail the coupon for a FREE Sample Lesson and my big FREE book, "How To Make Money In Radio, Electronics, Television." I train you at home during spare hours by putting you to work building, testing, repairing, working with 8 big kits of Radio parts I supply. You build a powerful 6 tube superhet Radio, a 16-range test meter, perform over 175 interesting, practical experiments. My lessons are easy and interesting . . . you need no previous experience in Radio. My famous *Business Builders* help you earn EXTRA CASH getting and doing neighborhood, Radio Service jobs while learning. You couldn't pick a better time to get into Radio. Good Radio Service and Repair Shops are needed everywhere as millions of new sets are in use. Trained men are wanted for opportunities in Police, Aviation and Marine Radio, F.M., Standard Broadcasting and Television. Mail coupon today for my FREE Books.

LEARN HOW TO BUILD-TEST-REPAIR RADIOS *By Working with* YOUR HANDS!



I give you a fine, moving coil type Meter—with parts for a complete analyzer and Circuit Continuity Tester. "Trouble-shoot" with professional accuracy.

You really learn Radio the PRACTICAL way . . . when you build this big, powerful 6-tube Superhet Radio from parts I send you.

You don't have to buy expensive ready-made equipment. You get valuable experience building this Signal Generator and Multi-purpose Tester.

You construct this rectifier, filter, resistor and condenser tester, and really get on the Practical end of Radio.

Trained Radio men can step into their own profitable Radio Service Shop—or

New developments constantly open new big pay job opportunities in Radio.

LOW COST RADIO TRAINING

STUDY AT HOME IN SPARE HOURS

Easy monthly payments, if desired. Everything you need is furnished — nothing else to buy. The equipment I send you is yours "for keeps"—to use in your business or job. I have trained thousands of successful Radio men — and I can help you, too. Get the facts about Sprayberry Training—it's your first step to success, security and a bigger income. Fill out and mail coupon today. I'll rush my 2 Free books to you by return mail.

VETERANS: Approved for G. I. Training under Public Laws 16 and 346.

SPRAYBERRY ACADEMY of RADIO
F. L. SPRAYBERRY, President
Room 5538, Sprayberry Bldg., Pueblo, Colorado

RUSH COUPON *Today!*

SPRAYBERRY ACADEMY OF RADIO
F. L. SPRAYBERRY, President
Room 5538, Sprayberry Bldg., Pueblo, Colorado
Please rush my FREE copies of "How To Make Money In Radio, Electronics and Television" and "How To Read Radio Diagrams and Symbols." No salesman will call.

*Name*_____ *Age*_____
*Address*_____
*City and Zone*_____ *State*_____
☐ CHECK HERE IF A VETERAN
(Mail in an Envelope or Paste on Penny Postcard)

INVENTORS

Learn how to protect your invention. The U. S. Patent Laws provide that any new and useful art, machine, article of manufacture, or composition of matter, or any new and useful improvement thereof, may be patented if the act of invention is involved. Therefore, every inventor with a valuable invention should take advantage of the Patent Laws and proceed for patent protection in order to safeguard his rights.

A patent gives the inventor the exclusive right to prevent others from making, using, or selling the invention claimed in the patent for a period of seventeen years.

The Patent Laws were enacted for the benefit of the inventor to give him protection for the features of his invention which are patentable. These features must be properly and concisely set forth and claimed in a formal application for patent, in order to comply with the requirements of the U. S. Patent Office. For that reason, the Patent Office advises the inventor, unless he is familiar with such matters, to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters.

A specially prepared booklet entitled "Patent Guide for the Inventor", containing detailed information with respect to patent protection and procedure, together with a "Record of Invention" form will be promptly forwarded to you without obligation upon request.

Registered

Patent

Attorneys

CLARENCE A. O'BRIEN & HARVEY B. JACOBSON
Registered Patent Attorneys
82-C District National Bldg., Washington 5, D. C.

Please send me copy of "Patent Guide for the Inventor" and also "Record of Invention" form. This request does not obligate me.

Name_____

Address_____

City_____ State_____

(Please write or print plainly.)

CLARENCE A. O'BRIEN
& HARVEY B. JACOBSON

82-C District National Building + Washington 5, D. C.

* For quick "STARTS" start using PYROIL

Pyroil assures constant lubrication between pistons and cylinder walls by giving oil the property of adhering to metal surfaces. This not only assures easier, quicker starting with minimum battery drain, but also prevents excess wear due to friction of metal against metal. Lubricated surfaces are safe, too, against rust and corrosion.

Ask your gas station attendant to add Pyroil—and add miles to your car.

Pyroil for Aircraft Engines
Use Aircraft Pyroil B for lubricating oil,
Aircraft Pyroil A for gasoline.

Manufactured and Guaranteed by Pyroil Company, 299 Main Street, La Crosse, Wisconsin

Canadian Distributors:
Central Purchasing Agencies, Ltd., Toronto, Ontario, Canada

PYROIL COMPANY
299 Main Street, La Crosse, Wisconsin
I want my car to last and run properly. Please tell me more about Pyroil, and how it can accomplish this for me.

Name .....

Address .....

City or Town ..... State .....

Letters

Money That May Save a Life

Sir:

The volunteer fire department here has purchased a resuscitator from the E & J Resuscitator Co., Chicago, Ill. By way of explaining the apparatus to the community we request permission to reprint an article that appeared in your July 1947 issue called "Machines That Breathe For You," by Herbert Johansen.

D. Wayne Rowland
Editor

The Willow Springs News
Willow Springs, Mo.

Willow Springs and its volunteer fire fighters are to be congratulated on their alertness in keeping up with new lifesaving equipment. Glad to help, PS is happy to grant permission to reprint its article.

Rats Rival Readers

Sir:

Will you please mix rat poison into your back-binding glue, so as to make it possible to preserve PS in the attic. I suggest also that PS furnish with every yearly subscription a cardboard or plastic bookcase big enough to take 12 issues.

Thomas E. Kulo

Glenview, Ill.

Better Safe Than Sorry

Sir:

I wish to make a protest about Michael S. Spacek's article on his homemade speed flash in the November issue. On page 201, he makes the statement: ". . . discharged the condensers by shorting their terminals with a well insulated screwdriver."

This is a very dangerous practice, since at the high operating voltages, terrific currents are released on short-circuit that may melt the screwdriver and throw molten metal into the eyes of the operator.

It is better to disconnect the power supply and then flash the tube, waiting about 15 minutes before opening up the unit. . . .

INVENTORS

Patent Laws Encourage The Development of Inventions

The Rules of Practice of the U. S. Patent Office advise—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims.

The firm of McMorrow, Berman and Davidson is registered to practice before the U. S. Patent Office. Additionally, it maintains a staff of attorneys able to readily understand inventors' disclosures, to advise concerning patentability, and to prepare appropriate specifications and claims for filing with the Patent Office.

If an inventor believes he has an invention, a search of the most pertinent prior U. S. patents should be made and a report obtained relative to its patentability. Where such report indicates that the invention appears patentable, in order to secure protection, diligence should be exercised in making application for a patent.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

PATENTS • TRADE MARKS • COPYRIGHTS

142-E VICTOR BUILDING, WASHINGTON 1, D. C.

McMORROW, BERMAN & DAVIDSON

Registered Patent Attorneys

142-E Victor Building, Washington 1, D. C.

Send me further particulars as to patent protection and procedure and "Invention Record" form at once. I understand that this request does not obligate me.

Name_____

Address_____

City_____ State_____

(WRITE OR PRINT NAME CLEARLY)

Embry-Riddle trained

DESIGN ENGINEERS

Rate Best Jobs...Everywhere

Embry-Riddle courses in design engineering lead to your success in aviation as a flight, project or maintenance engineer and to all types of drafting and design. In 26 years Embry-Riddle has trained almost 40,000 civilian and military students...and has always found good jobs for its technical school graduates.

Aviation needs thousands of skilled men. Embry-Riddle's expert staff trains you in fully equipped classrooms and laboratories for all standard ground and flight positions including radio and electronics. Features include daily work on live aircraft.

Excellent dormitories provide bachelor housing at Embry-Riddle. Live, work and play in beautiful Miami, where your training in aviation is complete with 365 flying days a year . . . and modern airliners fill the sky. Send coupon today for full information at no obligation to you!

Authorized G. I. Training

Embry Riddle International SCHOOL OF AVIATION MIAMI 30, FLORIDA

Dean of Enrollments – Dept. 61 — Embry-Riddle School of Aviation, Miami 30, Florida

PLEASE PRINT

Name _____ Age _____

Address _____

City _____ State _____

I am interested in: Airplane and Engine Mechanics (A & E) ☐ Design Engineering & Maintenance ☐ Aeronautical Drafting & Design ☐ Flying Mechanic ☐ Airplane Operation & Maintenance ☐ Flight Training ☐ Radio and Mechanics ☐

Check One: Veteran ☐ Non Veteran ☐

TRAIN IN MIAMI -- AIR CAPITAL OF THE WORLD

I have built one unit entirely of war-surplus equipment. This unit is now being used in a studio here in Brooklyn. I am at present building a second unit with the idea of making it battery-powered. . . .

LT. WILSON H. HEYDT, U. S. M. C.
Brooklyn, N. Y.

Mr. Spacek reports that the danger of this happening with the particular equipment discussed in the article is extremely slight. To be on the absolutely safe side, however, the method Lt. Heydt describes is the proper one if time permits.

Gus Guesses Right

Sir:

Being intensely interested in cars, I always read Gus's adventures. . . . This one (December) went too far: "Deftly Gus checked the fuel and ignition systems; both were operating properly."

I'd like to know how he managed to find the fuel pump and distributor operative when the camshaft gear was stripped. There might have been an electric pump, but that still leaves the ignition system.

JAN RAVEN
Chicago, Ill.

Martin Bunn, Gus's creator, comes to his character's defense with the following:

Sir:

What Gus did was to disconnect the line from pump to carburetor, find it full, and assume the pump was okay. Then he separated the distributor breaker points while holding the high-voltage coil lead a bit off the block. A juicy spark suggested the ignition system was okay.

I'll admit that neither check was conclusive, but both were a fair enough first check—remember, he'd only just begun. In retrospect, I can see that Gus should have hit the starter with the fuel line off; since gas wouldn't have spurted out, he'd have suspected first the pump and then the camshaft. But his inspiration, you'll recall, solved the problem even faster!

MARTIN BUNN

Right Wrench, Wrong Reader

Sir:

Well nigh unforgivable for PS is its December editorial, showing the wrench

"He's going places, that boy!"

"Fred came here as a machinist three years ago. Not too much experience, but with a yen to learn and plenty of ambition. He caught on quickly — so quickly, in fact, that I got a little curious.

"Sure enough, it wasn't long before I got a report on him from the International Correspondence Schools. He had enrolled in an I.C.S. Shop Practice course and was making better-than-average grades. On the job, he applied what he learned. In fact, he 'showed up' many of our more experienced machinists. It paid off.

"When we needed someone to study and recommend the shop equipment for our new plant, Fred got the job. He's on 'salary' now, working here in the front office. When we move, he'll be put in charge of maintenance and repairs. It's a big step up, but he's trained for it — and in this business, *it's the trained men who get ahead!*"

Thousands of successful "Freds" have acquired their all-important Shop Practice training from the world-famous International Correspondence Schools. If advancement appeals to you, lose no time in following their lead. You can study an I.C.S. Shop Practice course in your spare time — at low cost.

Mark and mail the coupon — it's your bid for a well-paid, responsible place in the competitive world of tomorrow.

INTERNATIONAL CORRESPONDENCE SCHOOLS

ICS

BOX 7604-M, SCRANTON 9, PENNA.

Without cost or obligation, please send me full particulars about the course BEFORE which I have marked X:

Air Conditioning and Plumbing Courses
- ☐ Air Conditioning
- ☐ Heating ☐ Plumbing
- ☐ Refrigeration ☐ Steam Fitting

Chemistry Courses
- ☐ Chemical Engineering
- ☐ Chemistry, Analytical
- ☐ Chemistry, Industrial
- ☐ Chemistry, Mfg. Iron & Steel
- ☐ Petroleum Refining ☐ Plastics
- ☐ Pulp and Paper Making

Civil Engineering, Architectural and Mining Courses
- ☐ Architecture
- ☐ Architectural Drafting
- ☐ Bridge and Building Foreman
- ☐ Building Estimating
- ☐ Civil Engineering
- ☐ Coal Mining
- ☐ Contracting and Building
- ☐ Highway Engineering
- ☐ Lumber Dealer
- ☐ Reading Structural Blueprints
- ☐ Sanitary Engineering
- ☐ Structural Drafting
- ☐ Structural Engineering
- ☐ Surveying and Mapping

Communications Courses
- ☐ Electronics
- ☐ Practical Telephony
- ☐ Radio, General
- ☐ Radio Operating
- ☐ Radio Servicing
- ☐ Telegraph Engineering

Electrical Courses
- ☐ Electrical Drafting
- ☐ Electrical Engineering
- ☐ Electric Light and Power
- ☐ Lighting Technician
- ☐ Practical Electrician

Internal Combustion Engines Courses
- ☐ Auto Technician ☐ Aviation
- ☐ Diesel-Electric
- ☐ Diesel Engines ☐ Gas Engines

Mechanical Courses
- ☐ Aeronautical Engineer's, Jr.
- ☐ Aircraft Drafting
- ☐ Flight Engineer
- ☐ Forging ☐ Foundry Work
- ☐ Heat Treatment of Metals
- ☐ Industrial Engineering
- ☐ Industrial Metallurgy
- ☐ Machine Shop
- ☐ Mechanical Drafting
- ☐ Mechanical Engineering
- ☐ Mold-Loft Work
- ☐ Patternmaking—Wood, Metal
- ☐ Reading Shop Blueprints
- ☐ Sheet-Metal Drafting
- ☐ Sheet-Metal Worker
- ☐ Ship Drafting ☐ Ship Fitting
- ☐ Tool Designing
- ☐ Toolmaking
- ☐ Welding—Gas and Electric

Railroad Courses
- ☐ Air Brake ☐ Car Inspector
- ☐ Diesel Locomotive
- ☐ Locomotive Engineer
- ☐ Locomotive Fireman
- ☐ Railroad Section Foreman

Steam Engineering Courses
- ☐ Boilermaking
- ☐ Combustion Engineering
- ☐ Engine Running
- ☐ Marine Engineering
- ☐ Steam Electric ☐ Steam Engines

Textile Courses
- ☐ Cotton Manufacturing
- ☐ Rayon Weaving
- ☐ Textile Designing
- ☐ Woolen Manufacturing

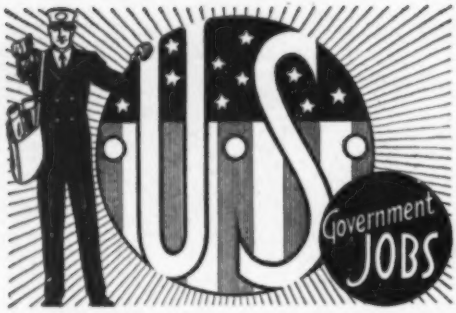
Business and Academic Courses
- ☐ Accounting ☐ Advertising
- ☐ Arithmetic ☐ Bookkeeping
- ☐ Business Administration
- ☐ Business Correspondence
- ☐ Certified Public Accounting
- ☐ Commercial
- ☐ Commercial Art
- ☐ Cost Accounting
- ☐ Federal Tax
- ☐ First Year College
- ☐ Foremanship ☐ French
- ☐ Good English ☐ High School
- ☐ Higher Mathematics
- ☐ Motor Traffic ☐ Postal Service
- ☐ Salesmanship ☐ Secretarial
- ☐ Sign Lettering
- ☐ Spanish ☐ Stenography
- ☐ Traffic Management

Name_____ Home Address_____

City_____ State_____

Age_____ Present Position_____ Working Hours_____ A.M. to_____ P.M.

Special tuition rates to members of the Armed Forces. Special discount to World War II Veterans.
Canadian residents send coupon to International Correspondence Schools Canadian, Ltd., Montreal, Canada.



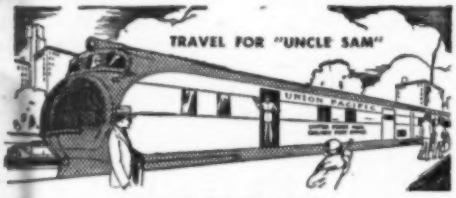
Start As High As $3,021 a Year

Get Ready Now for Next Examinations In Your Locality

Veterans Get Preference

City Mail Carriers, Post Office Clerks

Clerks and Carriers now get $2,100 the first year on regular and automatically increase $100 a year to $3,100. Open to men, women 18 to 50.



Railway Postal Clerks

Railway Postal Clerks get $2,300 the first year regular, being paid on the first and fifteenth of each month. ($95.83 each pay day.) Their pay is automatically increased yearly to $3,400. Advance may be had to Chief Clerk at $5,400 a year. ($225.00 each pay day.) Male Veterans Only.

3 Days On—3 Days Off—Full Pay

Railway Postal Clerks on long runs usually work 3 days and have 3 days off duty or in the same proportion. During this off duty their pay continues just as though they were working. They travel on a pass when on business. When they grow old, they are retired with a pension.

Many Other Positions

Many other positions are obtainable. Rural Carriers—Stenographers—Typists—Assistant Statistical Clerks—Customs Inspectors—Office Machine Operators—etc. Those wishing these positions should qualify at once.

Get Free List of Positions

Fill out the following coupon. Tear it off and mail it today —NOW, at once.

This investment can result in your getting a big paid government job.

FRANKLIN INSTITUTE, Dept. W81, Rochester 4, N. Y.

Rush to me, entirely free of charge (1) a full description of U. S. Government Jobs; (2) Free copy of illustrated 32-page book, "How To Get A U. S. Government Job"; (3) List of U. S. Government Jobs; (4) Tell me what to do to qualify for one of these jobs.

Name.....

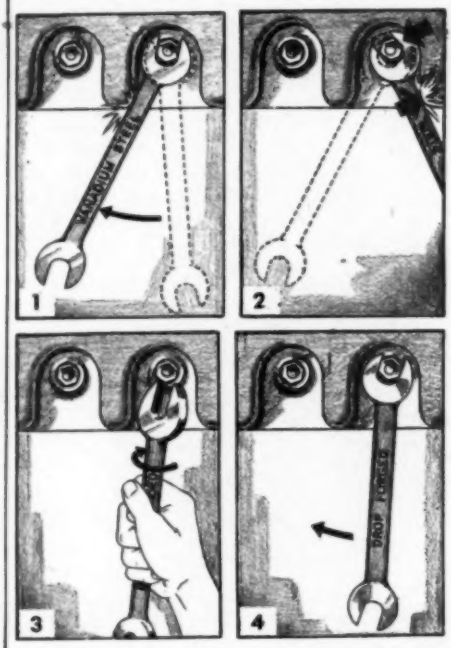
Address.....Vet?.....

Use This Coupon Before You Mislay It. Write or Print Plainly.

wrongly applied to the bolt. The short lug of the open-end wrench should be on the same side as the direction of pull. Or does PS just look its own ignorance in the face and say "so what?"

LEO SELTY

Croton-on-Hudson, N. Y.



The General Motors Corp., which should know something about wrenches if anyone does, provides the above drawings to show how the offset head on an open-end wrench can be reversed for greater nut movement at close quarters. In No. 1, the wrench head is turned in the direction of swing; No. 2, the wrench is brought back for second swing but this time will not fit on nut; in No. 3, it is reversed; and in No. 4, it is placed on nut with head turned away from direction of swing, permitting greater movement of the nut than would otherwise be possible.

Thought We Knew Nails

Sir:

In your December issue in the article "Think You Know Nails?" it is stated on page 141 that 10-gauge rod and wire are being drawn into five-gauge wire. This is impossible, for according to the American,

PATENT PROTECTION *for* INVENTORS

A PATENT IS A VALUABLE RIGHT

On the basis of a constitutional provision Congress has established a system under which inventors may secure the exclusive right to prevent the unauthorized use, manufacture and sale of their inventions for periods of seventeen years. The inventor secures this protection by obtaining a patent from the United States Patent Office.

THE United States Patent Office recommends in its Rules of Practice that "an applicant is advised, unless familiar with such matters to employ a competent registered patent attorney or registered patent agent, as the value of patents depends largely upon the skillful preparation of the specifications and claims."

WE recommend that you authorize us to conduct a search through the U. S. Patents pertinent to your invention and submit a report setting forth our opinion regarding its patentability.

Victor J. Evans & Co. has a staff of experienced registered patent attorneys, available to represent inventors in the preparation and prosecution of their cases before the Patent Office. Detailed information and the steps to be taken in obtaining patent protection will be furnished upon request.

FORM BELOW FOR MAILING CONVENIENCE

VICTOR J.
EVANS & CO.

Merlin M. Evans
REGISTERED PATENT ATTORNEY
340-C Merlin Building, Washington 6, D. C.

Please forward to me detailed information regarding procedure to obtain Patent Protection, together with your convenient "Evidence of Invention" form.

Name.....

Address.....

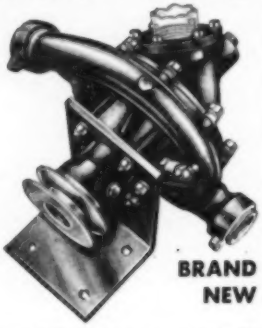
City and State.....

PATENTS • • • • TRADEMARKS • • • • COPYRIGHTS

WAR SURPLUS BARGAIN SPECIAL

CENTRIFUGAL PUMP

Ready For use on any Liquid Pumping Need



BRAND NEW

Use it for

DRAINING BASEMENTS • HOME WATER SYSTEMS • IRRIGATION • STOCK WATERING • FIRE PROTECTION • DRAINING PONDS, TANKS, etc. • INDUSTRIAL PUMPING

A super value for all types of intermittent service in pumping large volumes of liquid in home, farm and industrial service. Ideal for home water systems, draining basements, fire protection, etc. On the farm for watering stock, draining ponds, sprinkling, etc. In shops and factories for all types of pumping service.

MOVE LARGE VOLUME QUICKLY

When operated at 1750 RPM, will pump 42 gallons per minute on a 23 foot head; at 3600 RPM on 52 foot head will pump 88 gallons per minute. May be run with electric motor, gas engine or power take-off on tractor.

COMPLETE WITH PULLEY AND MOUNTING BRACKET . . . READY TO INSTALL

Pump has cast aluminum housing—accurately machined bronze impeller vanes. Complete with mounting bracket and 3½" V belt pulley. Shaft rotates on sealed ball bearings with grease gun fitting. Has 1½" threaded intake flange, two 1 inch outlets. Use one or both, as necessary. Made for Packard Motor Car Co. for use in Rolls-Royce Merlin Aircraft engines.

GREATEST PUMP VALUE IN YEARS

Original cost approx. $147.00. Sold F.O.B. Chicago. Shipping weight 23 lbs. Complete engineering reports and operating instructions free with pump. You can't beat this pump value at anywhere near this price. Satisfaction guaranteed.

Original Cost Approx. $147.00.

COMPLETE WITH PULLEY AND MOUNTING BRACKET—READY FOR USE..... $29.75 F.O.B. CHICAGO

STENCIL OUTFIT

Contains—1 stencil brush; 1 can paint, stencil paste, 1 complete set of metal letters, figures, punctuation and spacers.

Here is YOUR identification stencil set! Saves time, money and effort, easy to use, pays for itself. Metal letters, INTERLOCKING to make words. Comes in handy wooden box with sliding top. Ideal for all industries in marking boxes and packages, identifying inventory, numbering doors, etc. GUARANTEED.

Complete kit with 1" letters..... $2.50 Prepaid

Complete kit with 2" letters..... $3.95 Prepaid

GROBAN SUPPLY CO.

DEPT. P S-3, 1507 S. MICHIGAN AVE., CHICAGO 5, ILLINOIS

British, and French scales, 10-gauge wire is smaller than five-gauge. You could draw five-gauge down to 10 but never 10 to five.

JOSEPH PRZENESLO

Joliet, Ill.

Just as curious as Mr. Przeneslo, PS passed the buck along to William Vogel, author of the article, who replies as follows:

Sir:

My mistake. The following is from my notes at Sparrows Point: "wire mill, 20 tons a shift, five to 10 gauge, three drafts, makes eight- or 10-penny nails out of 10 wire." The sentence should have read: "In three drafts, five-gauge rod can be reduced to 10-gauge wire. . . ." Tell your correspondent that I have been assigned to chew 10-gauge wire for five minutes. . . .

WILLIAM P. VOGEL, JR.

Norwalk, Conn.

How Long Did You Say?

Sir:

Under a picture in the article on nails, you state that an eight-inch-square bloom 50 feet long is converted to a four-inch-square bloom 227 feet long. The eight-inch-square bloom contains 38,400 cubic inches. The four-inch-square bloom contains 43,584 cubic inches. Now where did the other 5,184 cubic inches come from?

WILLIAM M. WILSON

Hartford, Conn.

Search us! Since the volume ratio of the eight-inch-square bloom to the four-inch-square bloom is four to one, the four-inch-square bloom should have been given as 200 feet long, instead of 227.

Filing Through

Sir:

Now that my 1947 file of PS is complete, I'd like to read over some of your how-to-make articles and get busy in my shop. But I sometimes have to hunt through 11 copies before I find the one I want. Why don't you publish a yearly index of such articles?

HARRY FRANK

New York, N. Y.

We do. The 1947 Mechanics and Handicraft index is now ready. Order from our Book Department and enclose 10¢.

Groban Really Offers Bargains—Available Now!

AUTO COMPASS

Know where you're going at all times with this NEW North Star brand auto compass. Easily mounted on automobiles, aircraft, boats, etc. Comes complete with mounting bracket and instruction sheet. Can be manually adjusted. Easily compensated. Formerly $4.95....NOW **$2.95**

GRINDING WHEELS

ACTUALLY WORTH $50.00

A wonderful buy! 350 pieces incl. 35 ass't. Grinding and Cut-off wheels up to 10 inches diameter. 1/16 to 1¼" face, ⅛ to 3 in. holes. Ass't. grits—all brand new—Made by Norton, Carborundum, Macklin, Bay State, etc. Also included are 100 slotted disc cloths; 100 paper discs; 10 pencil rolls; 20 abrasive strips; 2 felt bobs; 3 felt wheels; one 4" rag buff; 3 honing stones; 10 abrasive sleeves; 10 mounted stones, ⅛ and ¼ shank; 2 mandrels; 2 rotary files, ¼" shank; 50 abrasive discs; 2 72" abrasive belts; 5 9x11 abrasive sheets. **SATISFACTION GUARANTEED.**

350 PIECES —Ass't. sizes FOB Chicago —ALL FOR ONLY $6.95

HAND GRINDER STONES

41 PIECE ASSORTMENT

For home and Shop—Packed in attractive set-up box as illustrated. Would cost well over $15.00 if bought separately! Consists of:

20 Mounted Stones. Assorted shapes and grits, all on ⅛" shanks.

10 Mounted Stones. Assorted shapes, all on 3/32 inch shanks.

10 1x½x1/8 inch Grinding Wheels. Top quality and all brand new.

1 ¼x1x⅛ inch Mandrel.

SATISFACTION GUARANTEED
Postpaid in U.S.A.

All Brand New

COMPLETE 41 PIECE BRAND NEW ASSORTMENT, ONLY **$4.95**

HI-PRESSURE CYLINDER

NEW. 11 ¼"x2". 1CC3A 1800-P.S.I. Can be filled with CO2 and used as tire inflater or fire extinguisher. Also as pulsating tanks, storage tanks. Wheel control brass valve. COST THE GOVERNMENT $9.80...**NOW ONLY $1.95**

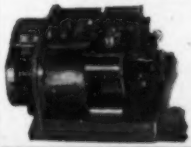
CLUTCH WITH UNIVERSAL JOINT

Brand new. Formerly used on Amphibious Jeeps. Has shaft 3 ft. long and 5 inch pulley . . . with ball bearings in pulley can be used for power take-off with winch and hoist.

Only $4.95

Worth a lot more!

AUTOMATIC PILOT SERVO UNIT



24V. electric motor with forward and reverse solenoid clutches and brake assembly. To open and close garage doors. Adaptable for boat control, tapping machine, etc. Has powerful gear set-up, limit switches 8"x9"x6". **ONLY**..... **$7.95**

F.O.B. Chicago

WAR SURPLUS
BARGAIN SPECIAL

Original Cost $45.00 Now Only $9.95 Prepaid in U. S. A.

BRAND NEW!

WORTH MANY TIMES THIS LOW SALE PRICE

VACUUM-AIR HYDRAULIC GENERAL PURPOSE PUMP

Use Them for

OIL BURNERS
SPRAYING MACHINES
MILKING MACHINES
COMPRESSORS
VACUUM PUMPS
HYDRAULIC SYSTEMS
MANURE LOADERS
PRESSES, etc.

● Originally cost $45.00. May be used as air or fluid pump—for pressure or vacuum. Standard ⅜ inch pipe thread with interchangeable ports. Will pump 7½ gal. SAE 30 oil per minute at 300 RPM. Builds air pressure of 30 lbs. per sq. in. at 1000 RPM. Vacuum will draw 26 inches of mercury at 1750 RPM. Develops up to 120 lbs. per sq. inch of hydraulic pressure, which in conjunction with a 3 inch hydraulic cylinder will lift 840 lbs. minimum. Runs forward or reverse. Self aligning shaft. Die cast aluminum housing 6x4x4 inches. Has stainless alloy steel vanes and impeller. Made by Bendix Avia. Corp. Spline terminal for direct drive—readily replaced with a pulley. Recommend a ¼ H.P. or stronger electric motor. Rated capacity 1500 RPM with high overload factor. Special price for quantity users. Complete illustrated engineering report and instruction booklet **FREE** with every pump. Send check or money order today! Postpaid in U.S.A..... **$9.95**

U. S. SURPLUS BARGAIN

POLAROID GOGGLE KIT

Brand New! In original packing. Each with four interchangeable lenses.

Shock Proof Frame Shatterproof Lenses

Use them for all outdoor sports, beach, motoring, boating—anything. Heavy windproof sponge rubber ventilated frame with snap button lens retainers! Adj. elastic head band. Clear, red, green, amber, flexible, shatterproof lenses, all instantly interchangeable. With carrying case. They won't last long at this price—it's smart to buy an extra. **$1.00** Prepaid in U.S.A.

150 PIECE ASSORTMENT

MOUNTED STONES, FILES, BURRS, BUFFERS

ALL BRAND NEW

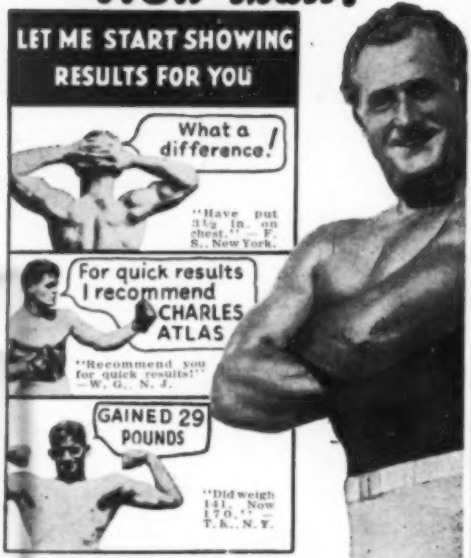
Amazing value for home and shop! There are hundreds of uses for this great array of wanted parts.

8 mtd. grinding stones on ⅛" shank
3 Fast cutting grinding wheels ¾ x ⅛"
1 Circular saw ¾ x .023 x ⅛"
3 1" sewed muslin buffs
6 ⅞" cut-off wheels
4 Cutters, ass't shapes ⅛" shank
1 ¾ x 3/32 mtd. wire brush
5 Ass't felt wheels
2 ¾ x ⅛ 1/16" rubber wheels
3 Ass't bristle brushes, mtd.
3 Cutters 3/32" shank
4 Mtd. wheels on 3/32" shank
100 Emery discs, ⅞" med. grit
1 Roughing stone
1 Felt cone
5 ⅛ x 1/16" mandrels

REGULAR RETAIL VALUE over $20.00 NOW—for years of service—get this great assortment for only ..... **$7.95** Postpaid in U.S.A.

GROBAN SUPPLY CO. DEPT. P S-3, 1507 S. MICHIGAN AVE., CHICAGO 5, ILL.

Will You Let Me PROVE I Can Make YOU a *New Man?*



I COULD fill this whole magazine with enthusiastic reports from OTHERS. But what you want to know is — "What can Atlas do for ME?"

15 MINUTES A DAY

Just give me 15 minutes of your spare time daily. That's all I ask. And even in that short time I'll start giving RESULTS. And it will be the kind of RESULTS that you (and anyone else) can SEE, FEEL, MEASURE with a tape.

FREE BOOK

I myself was once a 97-pound weakling — sickly, half-alive. Then I discovered "*Dynamic Tension*," And I won the title, "The World's Most Perfectly Developed Man!"

"*Dynamic Tension*" has done so much for other fellows that I simply ask you to let me prove that it can make a New Man of YOU — that it can start new inches of power pushing out your chest — build up your shoulders to champion huskiness — put new, hard, firm muscles on your biceps — make those stomach muscles of yours hard ridges!

Why not risk a postage stamp? Send coupon for my 48-page illustrated FREE BOOK AT ONCE! Address me personally: Charles Atlas, Dept. 1C, 115 East 23rd Street, New York 10, N. Y.

CHARLES ATLAS, Dept. 1C
115 East 23rd Street, New York 10, N. Y.

I want the proof that your system of "*Dynamic Tension*" will help make a New Man of me — give me a healthy, husky body and big muscle development. Send me your free book, "Everlasting Health and Strength."

Name _____ Age _____
(Please print or write plainly)
Address _____
City _____ State _____

Famous **BAILEY DIESEL SCHOOLS**
Now Accepting
CIVILIAN STUDENTS!

Bailey has a national reputation for "finest training methods." Bailey teaches you fundamentals, plus the practical application of theory in plenty of actual shop work. Bailey is *approved* by industry. Bailey graduates get the jobs!

Civilian men and boys over 17 who are ambitious to get ahead will act now. Send for FREE catalog. No salesman will call.

BAILEY TECHNICAL SCHOOLS
1656 So. Grand Blvd., St. Louis, Mo.

TURN YOUR LONGHAND INTO

SHORTHAND in 6 Weeks at Home

Famous Speedwriting system. No signs or symbols; no machines; uses ABC's. Easy to learn; easy to write and transcribe. Fast preparation for a job. Surprisingly low cost. 100,000 taught by mail. Used in business and Civil Service everywhere. Also typing. Write for free booklet and sample lesson.

SPEEDWRITING, Dept. 2603-8, 55 W. 42 St., N. Y. 18

LEARN TO WRITE *a Good Hand!*

FOR BUSINESS AND SOCIAL SUCCESS!

Improve your handwriting at home quickly with my new instruction books just off the press. Master all the secrets of better penmanship. Simple and easy, fully illustrated, highly endorsed. Begin today. Write for: ☐ **New Free Book,** "How to Become a Good Penman", or check books wanted, $1.00 each. ☐ Business Writing ☐ Artistic Writing ☐ Card Writing ☐ Engrossing Alphabets ☐ Bird and Design Flourishing ☐ Complete Set $4.50 ☐ Enclose 10c for your name beautifully written and shading penpoint.

S. A. Ziller, President, TAMBLYN SCHOOL OF PENMANSHIP
439 Ridge Bldg. *In Business Over 53 Years* **Kansas City, Mo., U.S.A.**

"YOU ARE UNDER ARREST!"

Help Bring Crooks to Justice Through Scientific
CRIME DETECTION!

We have taught thousands this exciting, profitable, pleasant profession. Let us teach you **in your own home.** Learn Finger Printing, Firearms Identification, Police Photography, Secret Service Methods thoroughly, quickly, at small cost. Over 800 of all American Bureaus of Identification employ I. A. S. students or graduates. We can prepare you for this fascinating work during spare time. Write today, **stating age,** for "Blue Book of Crime."

INSTITUTE OF APPLIED SCIENCE, 1920 Sunnyside Ave., Dept. 1363, Chicago 40, Ill.

Photography for PLEASURE or PROFIT

Learn at home. Spare time. Practical basic training. Long-established school. Many have earned while learning. Send coupon below for free booklet, "Opportunities in Modern Photography" and full particulars.

AMERICAN SCHOOL OF PHOTOGRAPHY
1315 Michigan Avenue Dept. 1363 Chicago 5, Illinois

Send booklet, "Opportunities in Modern Photography," full particulars and requirements. No salesman will call.

Name ..... *Age* .....
Address .....
City ..... *Zone* ..... *State* .....

I will teach you... ELECTRICAL APPLIANCE REPAIRING

LEARN IN YOUR OWN HOME BY BUILDING, TESTING, REPAIRING

S. T. CHRISTENSEN
President & Founder

• Learn this fascinating, big money-making business. Repair all kinds of electrical appliances. Millions now in daily use will eventually require repair. Thousands of new appliances sold daily in all parts of the country! These unlimited prospects mean you will always have places to do profitable jobs. If you are mechanically inclined (can hold and use tools), you can qualify for this big steady-paying field. It is not at all unusual for appliance repairmen to charge on the basis of $5.00 to $6.00 an hour! WE TEACH YOU EVERYTHING! What trouble to look for, how to detect it, and how to quickly repair the appliance! Our course is written in simple, easy-to-understand language, is profusely illustrated with photographs and drawings and shows you each and every step! Also shows you how to build the power tools you need. Our FREE advisory service is yours for LIFE! Should intricate technical problems arise or the need for a special repair part, simply call on us! We teach you how to solicit business and how to keep it coming to you! Not a theory course but a practical, honest-to-goodness course written by and used by repairmen the country over. Price of course is so low the repairs on your own appliances should pay for it many times over.

New Electronic Kit Does All!

AND BEST OF ALL I'LL SEND IT TO YOU

• Knowing how valuable Practical Shop Training Experience is, particularly in the Electrical Field, I will send to you the CHRISTY ELECTRONIC KIT. It will be sent to you completely unassembled, together with detailed instructions on how to assemble this portable all-purpose, electric trouble finder! Read the partial list of its multiple uses listed below and realize how valuable and helpful such a kit will be to you! Every part is sent to you including the lightweight case, precision meter, jacks, etc., etc., even down to the very last screw! In addition to the practical electrical experience just assembling this kit will provide, we also include complete instructions as to the many, many ways this delicate instrument can be used by you. It took us years of academic training and years of hard work to obtain the knowledge this kit will give you. The combination of our Course and Electronic Kit will go a long way towards ASSURING YOUR SUCCESS.

MODEL 390 TESTS

- Current Consumption
- Heat Controls
- Electrical Circuits
- Motor Windings
- Shorts
- Refrigerators, Radios
- Irons, Fans
- Washing Machines
- Motors
- House Wiring, etc.

RUSH COUPON NOW!

CHRISTY SUPPLY CO.
2835 N. Central Ave., Dept. D-6201
Chicago 34, Illinois

Please send me free illustrated literature about America's Fastest Growing Industry—ELECTRICAL APPLIANCE REPAIRING.

Name.....

Address.....

City.....*State*.....

Blueprints guide today's spectacular aircraft developments...and the brilliant future of all aviation. *Back of* those blueprints is the Aeronautical Engineer–whose creative genius, technical knowledge, and professional skill bring about the improved designs, the new aircraft, the new power plants...that advance aviation so swiftly.

A career in this fascinating, profitable profession can be YOUR blueprint for a bright future. You will be in *Aviation*–a field in which the possibilities have barely been scratched. You will be in a profession vital to that field–*Aeronautical Engineering*. The door is wide for contributing your own original ideas to the progress of Aviation...for reaching the heights of personal achievement...for gaining security and success.

Train at Northrop

...birthplace of the great Flying Wings and other famous aircraft. Here your training is conducted by a division of Northrop Aircraft, Inc.–in the midst of a busy center of important research and development work. In only 2 years (*less* time, with advanced standing) you can complete the Northrop *Aeronautical Engineering Course*–a technical institute curriculum accredited by the Engineers' Council for Professional Development.

The Northrop course in *Aircraft and Engine Mechanics* (approved by the Civil Aeronautics Administration) requires only 1 year. Both courses are based on Northrop's long experience as a major employer of engineers and mechanics. Get complete information on the broad opportunities open to you in Aviation with Northrop training–send coupon now.

APPROVED FOR VETERANS

NORTHROP
Aeronautical Institute
Division of Northrop Aircraft, Inc.
1525 East Broadway
Hawthorne, Los Angeles County
California

Please send me the Institute catalog and complete information, including starting dates of classes. I am interested in ☐ Aeronautical Engineering
☐ Aircraft and Aircraft Engine Mechanics (A&E)

Name

Address Age

City Zone State

Check one: ☐ Veteran ☐ In Service ☐ Civilian

Do You Make These Mistakes in English?

MANY persons say "between you and I" instead of "between you and me"—or use "who" for "whom"—or don't know whether to spell certain words with one or two "c's" or "m's" or "r's," or with "ie," or "ei," etc. Every time you speak or write you show what you are. Mistakes in English reveal lack of education, refinement. Lack of language power prevents you from presenting your thoughts in the strongest way. Real command of English will help you reach ANY goal. Stop making mistakes in spelling, punctuation, pronunciation, grammar. Increase your vocabulary.

Sherwin Cody

WONDERFUL INVENTION

Only 15 minutes a day with Sherwin Cody's new invention—and you can actually SEE your English improve. It teaches by HABIT—makes it easier to do the RIGHT way. Wonderful self-correcting lessons.

FREE BOOK ON ENGLISH Lack of language power may be costing you friendships, income, every year. See what Mr. Cody can do for you: it costs nothing to find out. Write this very minute for free book "How You Can Master Good English in 15 Minutes a Day." It will prove a revelation. WRITE NOW. **Sherwin Cody School of English, 193 S & C Bldg., Rochester 4, N. Y.**

Learn To MOUNT BIRDS

Tan SKINS,-Make Up FURS

Be a Taxidermist. *Double your hunting fun.* We teach you **at Home.** Mount **Birds, Animals, Pets, Heads and Fish.** Save your hunting trophies; decorate home and den. **MAKE MONEY.** Mount and Know-how for others. Big spare-time profits. **INVESTIGATE TODAY.**

FREE BOOK with 100 game pictures, 48 pages. Hunters, get young! It's **Now Free.** Send postal card **TODAY — This Minute!** State your **AGE.**
NORTHWESTERN SCHOOL OF TAXIDERMY, Dept. 9303, Omaha, Nebr.

PHOTOGRAPHY
for Fun or Profit

STUDY AT HOME. Photography offers leisure time enjoyment and well-paid, fascinating career. Ever-increasing opportunities! Success-proved N.Y.I. training qualifies you at home. Also resident courses. Details FREE!

NEW YORK INSTITUTE OF PHOTOGRAPHY
Dept. 5, 10 West 33 St., New York 1, N. Y., (37th Year)

LEARN MONEY-MAKING CARTOONING

IN SPARE TIME — by Easy Picture Chart Method
Same Simplified Method that has helped train creators of "Terry & Pirates," "Freckles," "Out Our Way," "Winnie Winkle," "Reg'lar Fellers," "Strange As It Seems," "The Neighbors," and many others. Earn while learning. Send 10c for Picture Chart (to test your ability). Samples of successful students, and full details. (State age.)

The Landon School, 4873 Cleveland Transit Bldg., Cleveland, O.

RADIO **ENGINEERING** Television, FM, Broadcasting, Servicing, Electronics, Aviation, Marine & Police Radio taught thoroughly. 72 weeks' Engineering course equivalent to 3 years' college radio work. Approved Veteran Training. Catalog upon request.
Valparaiso Technical Institute. Dept. 503, Valparaiso, Ind.

APTITUDE TESTS discover the kind of work or studies best for your success! You get a personal report—a guide for life—more happiness—more prosperity. (for men, women, boys, girls.) Write for complete facts
VOCATIONAL COUNSELING INSTITUTE
5057 Woodward Ave., Detroit 2, Michigan

Thrilling Work **COLORING PHOTOS**

Fascinating vocation learned at home by those with aptitude. Thrilling pastime. National method brings out life-like colors. Free booklet.
NATIONAL PHOTO COLORING SCHOOL
1315 S. Michigan, Dept. 1363, Chicago 5

New Designs in

FRANZITE GRIPS

Modernize Your Gun! Improve Your Score!
Most durable grips made. Positively unbreakable! For Colt, Smith & Wesson, Hi-Standard, Ortgies, Luger & Mausers in a wide choice of beautiful designs in ivory, pearl, walnut, onyx, etc. Low prices. FREE CATALOG. Dealers Wanted.
SPORTS, INC., (Mfrs.) 5501 Broadway, Dept. S-3, Chicago 40, Ill.

Learn RADIO TELEVISION, ELECTRONICS by SHOP METHOD HOME TRAINING

Let NATIONAL SCHOOLS, of Los Angeles, a practical Technical Resident Trade School for over 40 years, train you for today's unlimited opportunities in Radio

these two **FREE** *books will tell you how*

GOOD JOBS AWAIT THE TRAINED RADIO TECHNICIAN

You are needed in the great, modern Radio, Television and Electronics industry! Trained Radio technicians are in constant and growing demand at excellent pay—in Broadcasting, Communications, Television, Radar, Research Laboratories, Home Radio Service, etc. National Schools Master Shop Method Home Study Course, with newly added lessons and equipment, can train you in your spare time, **right in your own home,** for these exciting opportunities. Our method has been proved by the remarkable success of National Schools-trained men all over the world.

You Learn by Building Equipment with Standard Radio Parts We Send You

Your National Schools Course includes not only basic theory, but **practical** training as well—**you learn by doing.** We send you complete standard equipment of professional quality for building various experimental and test units. You advance step by step until you are able to build the modern superheterodyne receiver shown above, which is yours to keep and enjoy. You perform more than 100 experiments—build many types of circuits, signal generator, low power radio transmitter, audio oscillator, and other units. The Free Books shown above tell you more about it—send for them today!

NOW! NEW PROFESSIONAL MULTITESTER INCLUDED

This versatile testing instrument is portable and complete with test leads, batteries and tubes. Simple to operate, accurate and dependable. You will be able to quickly locate trouble and adjust the most delicate circuits. You can use the Multitester at home or on service calls. It is designed to measure AC and DC volts, current, resistance and decibels. You will be proud to own and use this valuable professional instrument.

GET THE DETAILS—SEND THE COUPON

Lessons and Instruction Material Are Up-to-date, Practical, Interesting

National Schools Master Shop Method Home Training gives you basic and advanced instruction in all phases of Radio, Television and Electronics. Each lesson is made easy to understand by numerous illustrations and diagrams. All instruction material has been developed and tested in our own shops and laboratories, under the supervision of our own engineers and instructors. A free sample lesson is yours upon request—use the coupon below.

Here's Just a Few of the Interesting Facts you Learn with the **FREE MANUAL**

1. Routine for diagnosing Radio Troubles.
2. Preliminary inspection of Receivers.
3. How to Test and Measure Voltages.
4. How to Test Speaker in Audio Stages.
5. How to Trace the Circuit and Prepare Skeleton Diagram.
6. Complete Reference Table for Quickly Locating Receiver Troubles.

VETERANS If you are a veteran, qualified for training under the G.I. Bill, check the coupon for a Special Bulletin.

G. I. APPROVED

NATIONAL SCHOOLS

LOS ANGELES 37, CALIFORNIA EST. 1905

MAIL OPPORTUNITY COUPON FOR QUICK ACTION

National Schools, Dept. PB-3
4000 South Figueroa Street
Los Angeles 37, California

(Mail in envelope or paste on penny postcard.)

Mail me FREE the books mentioned in your ad including a sample lesson of your course. I understand no salesman will call on me.

NAME..... AGE.....

ADDRESS.....

CITY..... ZONE.... STATE.....

☐ Check here if veteran of World War II

PAINTING and DECORATING
CARPENTRY and WOOD WORKING
ELECTRICAL WORK
PLUMBING
MASONRY
METAL-WORKING

ONLY $1.60 each
EXAMINE FREE

NOW Fix it Yourself!
THE HOME MECHANICS LIBRARY

Here, in six great volumes, is everything you need to know to do any job in or around your home—*repairs, alterations, new projects.*

SEND NO MONEY. Just mail coupon below for any or all of these brand-new "how-to-do-it" books. They show you, in careful detail, the most efficient, most workmanlike way of doing every job about the home and in the home workshop. Every move in the use of tools is shown by vivid, hands-at-work photographs, and there are complete directions, fully illustrated, for thousands of jobs large and small—from fixing a broken window to shingling a roof; from thawing a frozen pipe to installing a hot water heater; from varnishing a chair to painting a house.

MAIL THIS COUPON

D. VAN NOSTRAND COMPANY, Inc.
250 Fourth Avenue, New York 3, N. Y.
Please send me, for free examination, the books (or book) I have checked below:

- ☐ **PAINTING and DECORATING** . . $1.60
- ☐ **CARPENTRY and WOODWORKING** 1.60
- ☐ **ELECTRICAL WORK** 1.60
- ☐ **PLUMBING** 1.60
- ☐ **MASONRY** 1.60
- ☐ **METALWORKING** 1.60

Within 10 days I will either return the books (or book) or I will send you $1.60, plus a few cents postage, for each book I decide to keep. **(If you send the entire amount of your purchase with this coupon we will pay the postage. Same return privilege and refund guarantee if not completely satisfied.)**

NAME . . . . . .
ADDRESS . . . . . .
CITY . . . . . ZONE . . . STATE . . . . .
Pop. Sci.-3/48

Learn this Profitable Profession

IN 90 DAYS AT HOME

Money-Making Career Open to Men and Women, 18 to 50

Hundreds of men and women between 18 and 50 make $10 to $20 in a single day giving scientific Swedish Massage and Hydro-Therapy treatments. There is big demand from doctors, hospitals, sanatoriums and clubs. Graduates earn large full time incomes from these or in private practice in their own offices. Others make good money from home treatments given in spare time. Learn this interesting, money-making profession in your own home, through our home study course. Same instructors as in our nationally known resident school. You can win independence and prepare for future security by qualifying for your Diploma. Course can be completed in 3 to 4 months. Many earn while they learn. Begin your training at once.

Anatomy Charts & Booklet FREE

Enroll now and we will include, at no extra cost, many needed supplies. Fit yourself to help meet growing demand for Scientific Swedish Massage. Send the coupon at once for complete details, Anatomy Charts and 32-Page Illustrated Booklet, FREE, postpaid.

THE COLLEGE OF SWEDISH MASSAGE
Dept. 870-C, 100 East Ohio St., Chicago 11, Illinois
Please send me FREE and postpaid, Anatomy Charts, 32-page Booklet and complete details on Home Training.

Name _____
Address _____
City _____ State _____

Be A MASTER PLUMBER
Earn $15 To $50 A Day

DON'T ENVY THE PLUMBER—BE ONE

Every skilled workman will tell you that Plumbers have the best of it. WINTER and SUMMER the Plumber is busy at top wages. No skilled Plumber is ever out of a job—compare his opportunities with any trade, plus the opportunities of having your own shop.
We teach you Plumbing with TOOLS (not books) under Licensed Master PLUMBERS in one of the finest equipped schools in America. We make you a Plumber, every branch is taught thoroughly—Lead Work—Blueprint for plan reading—all other tricks.

LEARN IN 30 WEEKS WITHOUT PREVIOUS EXPERIENCE

If you like to work with tools you owe it to yourself to investigate. No need to ever work as an apprentice. Get free bulletin. Write now! G.I. APPROVED. Our 24th year.

UNIVERSAL PLUMBING SCHOOL
819 HOLMES STREET KANSAS CITY, MO.

LAW FREE BOOK

Write today for FREE 48-page book, **"THE LAW-TRAINED MAN,"** which shows how to learn law easily in spare time at home through the Blackstone course prepared by 60 well-known law authorities. We furnish all material including 18-volume Modern American Law library. Many successful attorneys among our graduates. LL.B. degree. Moderate cost; easy terms; Money-Back Agreement.

BLACKSTONE COLLEGE OF LAW
225 N. Michigan Ave., Dept. 123, Chicago 1, Ill.
A Correspondence Institution Founded in 1890

GET INTO CARTOONING!
Let **Hartman** teach you cartooning, gag writing at home. Learn by mail from a professional! Send Name, Address for **FREE DETAILS.**
Hartman Studios, 2776 California Court, Lincoln 8, Nebr.

ANYONE CAN DO THIS IF THEY HAVE OUR CHART

SPECIAL OFFER FOR AGENTS

Blue print 27 x 36" now printed on both sides showing squares full size. Shows how to find the length of any rafter, find any angle, in degrees, frame any polygon three to sixteen sides, read the board foot and bracetable, octagon scale, rafter tables, many other uses, can be scaled down for model work as well as full scale framing. Also chart changing pitches to degrees. For use with radial saws. About 13 square feet of printed copy sent post paid for $1.00. No checks or stamps. MASON ENGINEERING SERVICE, 2032 N. Burdick St., Dept. 3, Kalamazoo 61, Mich.

AUXILIARY POWER PLANTS

Govt. cost $300. Our Price **$40**
Description available. No C.O.D.
NEW YORK OUTLET & SALES CORP., 144 Chambers St. N.Y. 7, N.Y.

BROKEN JEWELRY WANTED

All kinds. Highest prices paid for jewelry, rings, spectacles, gold teeth, diamonds, broken and usable watches, etc. Cash mailed promptly. Write for FREE shipping container.
LOWE'S, Dept. PS, Holland Bldg. St. Louis 1, Missouri

A PENNY POSTCARD MAY CHANGE YOUR FUTURE...

Get full information on the coin-operated vending machine industry. Start with a few machines and build a wonderful future. We'll give you complete advantage of our "know-how." Send for Free Booklet Today—No Routes Sold!

PIONEER VENDING SERVICE
ADDRESS ALL MAIL TO DEPT. PS
461 SACKMAN ST. • BROOKLYN 12, N. Y.

AGENTS WANTED

Sell top-quality Nurses', Beauticians', Doctors' and Utility uniforms at lower-than-competitors' prices. Leading manufacturer. Very substantial commission. Write Dept. P.

MEDI-KOTE CO., INC.
ROCKVILLE CENTRE, NEW YORK

Stop! Do You Want More Money A GOOD JOB or A BUSINESS OF YOUR OWN...

...Then You Can't Afford to Pass Up This OPPORTUNITY

For more than sixteen years we have been helping men like yourself ... men who sought opportunity ... men who wanted to get ahead. We believe we understand your problem as we have understood the problems of thousands of others.

NO ADVANCED EDUCATION ... NO EXPERIENCE NECESSARY

Fill in the coupon below and you will get, absolutely FREE, facts concerning our work, as well as information showing how we prepare YOU to get started in America's great opportunity field of Radio and Electronics. You'll see HOW you can tie in your future with a field that includes Television, FM Radio, Aviation Radio, Pre-Radar, Industrial Electronics, Broadcast Radio, 2-Way Train Radio, etc. You'll see HOW you may cash in on a grand opportunity to have your own business, or a real job— doing really interesting work!

As a HOME STUDENT, you receive a modern Home Laboratory that provides the practical experience you need — including 16 mm. HOME MOVIES to speed your progress.

If you choose to get your training in our new, modern Chicago Laboratory, you will work with lots of Radio-Electronic equipment under the personal supervision of some of the finest instructors in the field.

TAKE YOUR CHOICE

1. Our new, modern Chicago Training Center offers some of the finest RADIO-ELECTRONICS-TELEVISION training facilities in the nation. We will find comfortable living quarters for you.

2. You can get similar practical training in your spare time at home. You use 8 big kits of Radio parts and assemblies — giving you valuable practical experience at home from working out dozens of fascinating Radio-Electronic circuits. You also get instructive MOVIES RIGHT IN YOUR HOME.

VETERANS! Both our (1) Chicago Laboratory and (2) Home Training are accepted under the "G. I. Law."

VALUABLE EMPLOYMENT SERVICE. *When you complete either training, our effective Employment Service helps you get started toward a real Radio-Electronic future. Mail the coupon below today . . . do not delay.*

DeForest's Training, Inc.
CHICAGO, ILLINOIS
Associated with the DeVry Corporation Builders of Electronic & Movie Equipment

MAIL THIS OPPORTUNITY COUPON NOW

Mr. E. B. DeVry, President
DeForest's Training, Inc.
2533 N. Ashland Ave., Dept. PS-E3
Chicago 14, Ill.

Please show me how I may get started toward a good job or a business of my own in Radio-Electronics.

Name ..... Age....
Address ..... Apt.....
City ..... Zone... State.....

☐ If under 16, check here for special information.
☐ If a discharged veteran of World War II, check here.

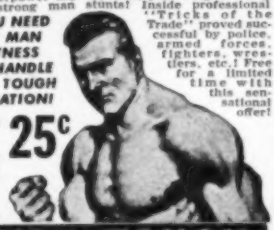
HOW TO Fight! Wrestle! Jiu-Jitsu!

FREE

Plus Weight Lifting! Strong Man Stunts!

Be prepared to protect your family, friends, yourself in any emergency! Be admired! George F. Jowett, Champion of Champions, gives you free his "SMASHING CHAMPION SECRETS." Contains many "HOW-TO-DO-IT" pictures that quickly and simply show you how to powerfully deliver a knockout, how to break any hold, how to overpower any opponent plus weight lifting and strong man stunts! Inside professional "Tricks of the Trade" proved successful by police, armed forces, fighters, wrestlers, etc.! Free for a limited time with this sensational offer!

YOU NEED HE MAN FITNESS TO HANDLE ANY TOUGH SITUATION!



NOW! All 5 Famous JOWETT COURSES in 1 Complete Muscle Building Volume! 25c

LET ME PROVE I CAN MAKE YOU—

COMMANDO-TOUGH

OR IT WON'T COST YOU A CENT!

says George F. Jowett WORLD'S GREATEST BODY BUILDER

Give Me 10 Minutes A Day
Learn My Time Tested Secrets of Strength

I'll teach you the "Progressive Power Method" that rebuilt me from a physical wreck condemned to die at 15, to the holder of more strength records than any other living athlete or teacher! Has proven it builds the strongest, handsomest men in the world. Let me prove on a money back basis—that no matter how flabby or puny you are that I can add inches to your arms, broaden your shoulders, give you a man-sized chest, powerful legs and a rock-like back—in fact power pack your whole body so quickly it will amaze you—right in your own home! I'll bring to life new power in you inside and out, until YOU are satisfied you are the man you want to be.

PROVE IT TO YOURSELF IN ONE NIGHT

Send only 25c for my 5 easy-to-follow, picture-packed courses now in 1 complete volume "How to Become a Muscular He-Man." Try it for one night! Experience the thrilling strength that surges through your muscles.

10 DAY TRIAL!

Think of it—all five of these famous courses now in one picture-packed volume for only 25c. If you're not delighted with this famous muscle-building guide—if you don't actually FEEL results within ONE WEEK, send it back and your money will be promptly refunded!

I am making a drive for thousands of new friends fast—REGARDLESS OF COST!

SO GET NOW MY 5 Muscle Building COURSES (Valued at $5 each)

All in 1 Great Complete Volume

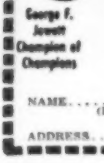
Packed With How-To-Do-It Pictures!

Now, this "get-acquainted," extremely low price of only 25c is your chance to build a body you'll be proud of! Follow Jowett's easy method of muscle building NOW! For Only 25c

PHOTO BOOK OF FAMOUS STRONG MEN!

FREE!

Photos that inspire you to might and muscle. Free with order.



George F. Jowett Champion of Champions

2 FREE GIFTS!

Jowett Institute of Physical Culture Dept. PS-83A
230 Fifth Avenue, New York 1, N. Y.

George F. Jowett—Please send by return mail, postpaid, FREE "Smashing Champion Secrets," and FREE Jowett's Photo Book of Strong Men, along with all 5 Muscle Building Courses. 1. Molding a Mighty Chest. 2. Molding a Mighty Arm. 3. Molding a Mighty Grip. 4. Molding a Mighty Back. 5. Molding Mighty Legs—Now all in One Volume "How to Become a Muscular He-Man." Enclosed find 25c. NO C.O.D.'S.

NAME.....AGE.....
(Please Print Plainly, Include Zone Number)

ADDRESS.....

STUDY AT HOME

With An Educational Institution

Men with specialized training win higher positions, insure larger earnings, and are bigger successes in business and public life. Opportunities NOW greater than ever before. Send for our Catalog.

ARTS and SCIENCES

Courses in Philosophy; Education; Letters; Public Health; Medical Jurisprudence; Psychology; Sociology; Physics; Chemistry; Plastics; Geology; Political Science; Theology; Business and Commerce; Accounting; Mathematics; Statistics; Agriculture.

ENGINEERING

Courses in Electrical, Civil, Mechanical, Drafting, Architectural, Steam, Aeronautical, Radio, Structural, Mining, Industrial, Petroleum, Marine, Chemical, Diesel, Automobile, Refrigeration, and Air Conditioning Engineering.

LAW

Complete Professional Law Course includes 18 Hornbrook Series college grade textbooks. Courses also in Commercial Law, Patent Law and Medical Jurisprudence.

McKinley-Roosevelt Incorporated, 4610-AB, Sheridan Rd., Chicago 40, Ill.

TRI-STATE COLLEGE

B.S. Degree in 27 months in Engineering (7 branches), Bus. Admin., Acctg. and Sec. Science. Graduates successful. 64th year. Enter Sept., Jan., March, June. Write for catalog. 538 College Ave., Angola, Ind.

LAW

STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction—over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 87-S, 646 N. Michigan Ave., Chicago, Ill.

TALK-SING thru your own radio with RADIO MICROPHONE

Be the life of the party. Put on your own broadcasts at home. Talk-Sing, make announcements from any room. Wonderful voice practice. Microphone easily attached to any radio. Follow enclosed instructions. SEND NO MONEY—pay Postman $1.98 plus postage. Send Money Order or check and save postage.

EMPIRE RADIO & TELEVISION CO. (Dept. R1) 1521 Bedford Ave., Brooklyn 16, N. Y.

BUILD YOUR OWN ZEOLITE WATER SOFTENER

You can do it inexpensively with only a wrench and a little spare time. Same Zeolite process as used by other leading water softeners. Send $1 for easy-to-follow directions and list of materials. (Materials available locally or from us.) Your money back if not satisfied.

LAKE REGION MFG. CO., 4184-B Xerwood Ave., Minneapolis 16, Minn.

GLOWS in the DARK

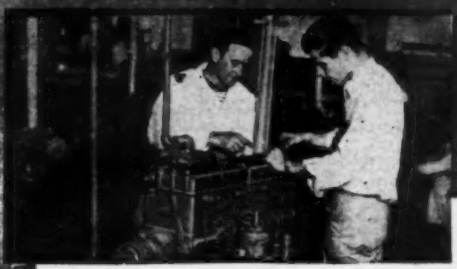
FREE Sample!

Be the first to sell luminous house numbers, light switch plates, wall protectors, pull cords. Also luminous pictures, statues, decals, and a host of religious, nursery and other objects that glow in the dark. Get into this *new* and *growing* industry. Enormous demand . . . no competition . . . sensational demonstration . . . big profits. Represent a large manufacturer, established over 34 years. Write today for liberal money-making offer and free sample to show how they *glow in the dark*.

5

MADISON MILLS, 303 Fourth Ave.
Dept. C-5 NEW YORK 10, N. Y.

DIESEL SPECIALIST OR AUTOMOTIVE TUNE-UP EXPERT



be ONE or BOTH...

YOU CAN TRAIN TO BE A DIESEL SPECIALIST or an **AUTOMOTIVE TUNE-UP EXPERT**—or **BOTH**—the famous **HEMPHILL SCHOOLS WAY.** Here are the highlights of these two practical, intensive courses. **READ THIS PAGE**—then **SEND FOR COMPLETE DETAILS!**

HEMPHILL DIESEL TRAINING available to you **at home.** You can study by means of up-to-date **HOME STUDY COURSE.** Gives theory of Diesel engines, their operation and maintenance. Lessons are simple, easy to understand, fully illustrated by drawings and photographs. Diesels are supplying more and more of the power in **transportation, trucking, shipping, power plants, agriculture, logging, construction** and other industries. This means **greater opportunities** for **trained Diesel** men.

HEMPHILL DIESEL RESIDENT SCHOOL TRAINING available to you in large, well-equipped shops at Los Angeles, California; New York and Memphis, Tennessee. Get the best Diesel training available at America's pioneer Diesel schools under expert instructors.

HEMPHILL AUTO TUNE-UP COURSE available to you in Los Angeles and Memphis. You learn practical modern methods of automotive trouble shooting, ignition and electrical system service and repair, carburetion, etc., on modern equipment. Here is a short, intensive course to quickly qualify you for this well-paid opportunity field. BE AN AUTOMOTIVE TUNE-UP SPECIALIST!

This streamliner is "going places" on Diesel power. How about you?

HEMPHILL SCHOOLS HOME STUDY AND RESIDENT COURSES APPROVED FOR VETERANS—AVAILABLE FOR NON-VETERANS ON EASY PAYMENT PLAN

MAIL COUPON TODAY—Get Free Literature

Hemphill Diesel & Automotive Schools
1601 S. Western Ave., Dept. PS-38 Los Angeles 6, California

Please send me, without obligation, complete information on your Diesel Courses, Home Study ☐
OR attend school in Los Angeles ☐ Memphis ☐ New York. ☐
Auto Tune-up Course, Los Angeles ☐ Memphis. ☐

Name.....Veteran ☐ Non-Veteran ☐
Street..... Zone.....
City..... State.....

CAPITOL RADIO ENGINEERING INSTITUTE

Pioneers in Radio-Engineering Instruction Since 1927

PCA Photo

The radio - electronics industry seeks technicians and engineers to man hundreds of new FM, AM and television stations now on the air or under construction . . . mobile communication units, commercial aircraft and ground radios. New applications for electronics are being developed rapidly in practically every industry. Radar navigation is a reality. Vast expansion in the electronics field has already taken place. More is in view. Electronics is an uncrowded field — crowded only with opportunity for career-trained technicians and engineers. Now's the time to do something about a secure future in this interesting field — and CREI is the school to help you do it. Prepare for a Well-Paid Future.

Get into this fast-growing industry. Prepare with CREI, an Accredited Technical Institute that starts with fundamentals, gives you home study training you can understand, and can take you all the way to a career. Twenty-one years of teaching background and experience are at your service. Practical engineers and technicians in hundreds of key positions throughout the field of electronics owe their successful training to CREI. Our graduates are eagerly sought by industry— as large numbers of letters in our files prove.

CREI Starts At the Beginning

If commercial radio is a new field for you, CREI's step-by-step method provides all necessary fundamentals. Then you proceed into the more advanced study of radio engineering principles and practice. Finally you may elect training at career level in highly specialized applications of broadcasting, television, and aeronautical radio.

Begin Training Now—At Home

Make yourself a *secure* future in electronics. You can do it — if you're willing to put your spare time to use. Send for FREE book with complete information and see for yourself how you can train for a high-income career with one of America's foremost technical institutes.

VETERANS: CREI Home Training is available under the GI Bill.

NON - VETERANS: Easy terms at pre-inflation prices.

(For an intelligent answer to your inquiry, please complete the coupon in full.)

CAPITOL RADIO ENGINEERING INSTITUTE
Dept. 23, 16th & Park Rd., N. W.
Washington 10, D. C.

Branch Offices:
New York 7: 170 Broadway
San Francisco 2: 760 Market St.

MAIL COUPON FOR FREE BOOKLET

CAPITOL RADIO ENGINEERING INSTITUTE, DEPT. 23, 16th & Park Road, N. W., Washington 10, D. C.

Gentlemen: Please send me your free booklet, "CREI Training For Your Better Job in Radio-Electronics" describing opportunities and CREI home study courses in Radio-Electronics and Television.

NAME ..... AGE .....
STREET .....
CITY ..... ZONE ..... STATE .....
OCCUPATION .....

☐ **I AM ENTITLED TO TRAINING UNDER G. I. BILL**

Check field of greatest interest:
☐ RADIO-ELECTRONICS
☐ BROADCAST AND TELEVISION
☐ AERONAUTICAL RADIO ENGINEERING
☐ RECEIVER SERVICING ☐ INDUST. ELECTRONICS

SEND FOR THIS

Make money with horses. Every farmer, every lover of horseflesh should have a copy of this booklet. If you want to know how to break, train and make money with horses, *write today for full information FREE*, together with my special offer of a course in Animal Breeding. If you are interested in Gaiting and Riding the saddle horse check here. ☐ *Do it today—now. You'll never regret it.*

BEERY SCHOOL OF HORSEMANSHIP
Dept. 583 **Pleasant Hill, Ohio**

MAKE MONEY CASTING AT HOME
FREE FACTS SENT

X.L. RUBBER MOLDS

Make your own rubber molds Cheaply. Cast thousands of perfect Book Ends, Ash Trays, Etc., from every mold. **Enormous Profits.** Start Small. **GROW BIG.** X. L. RUBBER, Pts. $2.00; Qts. $3.50; Gallons $8.95. Models & enough rubber for 3 molds $1.00. Foreign $1.50.

PLASTIC ARTS STUDIO, Rt. No. 2, Dept. 65, MUNCIE, INDIANA.

ENGINEERING DEGREE IN 27 MONTHS

INDIANA TECHNICAL COLLEGE

Aeronautical, Chemical, Civil, Electrical, Mechanical, and Radio Engineering (inc. television). Drafting. 1-yr. Gov't approved for G.I.'s. Low rate. Earn board. Large industrial center. Students from 48 states, 18 countries. Demand for graduates. Enter March, June, Sept., Dec. Catalog.

638 E. Washington Blvd., Ft. Wayne 2, Ind.

LEARN WATCH *and* CLOCK REPAIRING

Start training now for a better paying job or your own profitable business. Qualified Watch Makers are in demand . . . Unlimited opportunities. Intensive practical training by experienced watch makers. Approved for veterans. Write for full details. Indicate if Veteran.

SCIENTIFIC SCHOOL OF WATCH MAKING, Dept. PS-3
3923 San Fernando Road **Glendale 4, Calif.**

CANVAS COVERS **Waterproof tarpaulins,** war surplus (Used), perfect condition. Originally made for tents. Approx. 5'x8'. Two buttoned together make approx. 80 sq. ft. Complete with buttons attached. Suitable for use as canvas dams, hay covers, truck covers, machinery and equipment covers, etc. Packed in bales 40 each, priced 40 covers, **$1.00** ea; 15 covers, **$1.50** ea. Less than 15, **$1.75** ea. All FOB, Kansas City.

AMERICAN SUPPLY CO.
329 W. 5th **Dept. P. S.** **Kansas City, Mo.**

C. O. D. SHIPMENTS
AMERICAN & LUGER & MAUSER AMMUNITION
AUTOMATIC & REPEATING RIFLES & SHOTGUNS. Send $1 for gunsmith course, catalogue & journals. For ammunition C.O.D. send $1 extra. For gun C.O.D. send $20. Most all kinds guns & ammunition C.O.D.

NEW YORK CO., BLOCK 300, RIDGEWAY, PENNSYLVANIA

RUPTURED?

Get Relief This Proven Way

Why try to worry along with trusses that gouge your flesh—press heavily on hips and spine—enlarge opening—fail to hold rupture? You need the Cluthe. No leg-straps or cutting belts. Automatic adjustable pad holds at real opening—follows every body movement with instant increased support in case of strain. Cannot slip whether at work or play. Light. Waterproof. Can be worn in bath. Send for amazing **FREE** book, "Advice To Ruptured," and details of liberal truthful 60-day trial offer. Also endorsements from grateful users in your neighborhood. Write:

Cluthe Sons, Dept. 14, Bloomfield, New Jersey

PLASTICS

OFFERS YOU A GREAT FUTURE!

BECAUSE MORE AND MORE PRODUCTS ARE BEING MADE OF PLASTICS!

LOOK AT THESE INDUSTRIES!

AUTOMOBILE
Dash Boards
Steering Wheels
Transparent Tops

CONSTRUCTION
Wall Board
Plywood Laminates
Floor Coverings

ELECTRICAL
Wire Coatings
Insulating Materials
Control Panels
Bulb and Tube Components

TEXTILE
Hosiery
Clothing
Furniture Coverings

SPORTING GOODS
Golf Club Heads
Fishing Poles
Lines · Bowling Pins

RUBBER COMPOUNDS
Mechanical Rubber Goods
Kitchenware
Molds

LEATHER
Shoes
Luggage
Belts

MARINE
Hulls or Small Boats
Fittings
Ornaments and Controls

GENERAL MANUFACTURING
Radio Cabinets
Tooth Brushes
Combs
Pens and Pencils
Dishes, Jewelry,
Giftwares

ON AND ON—through industry after industry—thousands of useful, practical, everyday products made BETTER and CHEAPER from some kind of PLASTIC. That's why men and women trained in Plastics can qualify for a great future. YOU CAN GET THIS TRAINING NOW AT PLASTICS INSTITUTE, the world's largest and finest school devoted exclusively to Plastics.

STUDY AT HOME

or

YOU MAKE THINGS—Home study students get practical kit materials. You make handsome, useful articles. You form, dye, decorate, cast and laminate various types of plastics. You get experience designing and developing your own ideas.

AT PLASTICS INSTITUTE'S RESIDENT SCHOOL IN LOS ANGELES, CALIFORNIA

You can enroll for Plastics Institute's famous Home Study Course which prepares you for a career in plastics while you carry on your present activities. Or come to California for Resident Training in P.I.T I. shops and laboratories.

START YOUR TRAINING NOW—Mail coupon below for complete details of Plastics Institute's training developed under guidance of industry leaders. No wasted time or padded lessons. You learn quickly, easily.

PLASTICS INDUSTRIES TECHNICAL INSTITUTE

New York • Chicago • Los Angeles

APPROVED For Veterans

AVAILABLE For Non-Veterans

Plastics Industries Technical Institute, PS-38
1601 S. Western Ave., Los Angeles 6, Calif.
Gentlemen: Please send me literature and information on your
Resident School Courses ☐ Home Training Courses ☐

Name ..... Age.....

Street ..... Zone.....

City ..... State.....

Veteran..... Non-Veteran..... Previous Education .....

Your stepping-stone to a BETTER-PAYING

MACHINIST'S JOB

Master shop work quickly with these books

This big home-study and reference course gives you the practical facts on machines and methods you need to advance in machine shop work. Take advantage of the other man's experience as found in books, to solve your problems, increase your efficiency, with

The AMERICAN MACHINISTS' LIBRARY

6 volumes—2368 pages—2516 illustrations
(A combined home-study course and reference library)

This library of machine shop practice was written for practical men. It gives you the best methods for every kind of machine shop work. It fully explains lathes, drills, and other machine tools and their operation, automatic screw machines, speeds and feeds, gear design and production, jigs and fixtures, punch and die work, metal surfacing, etc., etc. Plainly written—completely illustrated—the best kind of help to the machine shop man who wants to advance himself

No money down—special price—easy payments.

EXAMINATION COUPON

McGRAW-HILL BOOK CO., Inc.
330 W. 42nd St., N. Y. C. 18

Send me for ten days' examination the American Machinists' Library. If satisfactory I will send you $4.00 in 10 days and $4.00 monthly until the price of $20.00 is paid. If not wanted, I will return the books postpaid.

Name .....
Home Address .....
City and State .....
Company .....
Position PSM-3-48

Learn to Repair ELECTRIC APPLIANCES

AT HOME in your SPARE TIME

WRITE TODAY for FREE BOOK

Prepare now for a permanent future, independence and security with a business of your own. Our practical, easy-to-learn home course teaches you, during your spare time, how to repair washing machines, vacuum cleaners, electric ranges, lamps, motors, irons, etc., REFRIGERATION and HOUSE WIRING.

OPEN YOUR OWN SHOP

For the man who is handy with tools, and likes to work with his hands as well as his head, there is a WIDE OPEN OPPORTUNITY today, in this great growing field. If you own your own shop you can depend on making more money in good times . . . and not losing your job in a depression. You can start a business of your own in your garage or basement with the tools we send you. One good repair job can pay for the rest of the entire course. Write today for our FREE BOOKLET.

I Send You a BIG KIT of Special TOOLS at NO EXTRA COST!

PACIFIC TRAINING SCHOOL
7217 So. Broadway, Dept. S-83, Los Angeles 3, Calif.

Dear Sirs: Please send me, without obligation, your free booklet and complete details.

Name .....
Address .....
City ..... *State* .....

GOOD PENMANSHIP makes favorable impressions and helps you win success. Poor penmanship contributes to failure. It makes no difference how poor you now write, you can quickly and easily learn **Business Writing**, and you can learn **Shaded Writing** also right in your own home during spare time by my **Simplified Method**, without cost of going away to school. Easy lessons. Diploma.

BEGIN NOW! Write for my FREE BOOK, "How to Become an Expert Penman," which contains valuable information and many specimens of penmanship that show what others have learned by taking my Courses. If you enclose 10c, I will send you one of my Favorite Penpoints suitable for plain or shaded writing, and your name with a beautiful flourished bird written on a card. Write TODAY.

Send for this FREE Book

T. M. TEVIS, BOX 25R, CHILLICOTHE, MO.

Learn to MOUNT BIRDS

FREE BOOK

Tan SKINS, make up FURS

Be a Taxidermist. Double your hunting fun. We teach you **at Home**. Mount **Birds, Animals, Fish, Heads**, common specimens. **Fun and profits.** Decorate home and den **MAKE MONEY.** Mount game, tan for others. Big profits in spare time. **WRITE TODAY.**

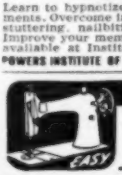
100 game pictures in FREE BOOK
Hunters, get your copy. It's **New Free.** Send post card. State your AGE.

NORTHWESTERN SCHOOL OF TAXIDERMY
Dept. 3393 Omaha, Nebraska

HYPNOTISM

Learn to hypnotize. Self-hypnosis. Secrets revealed. Exciting experiments. Overcome inferiority complexes, excessive smoking, alcoholism, stuttering, nailbiting, phobias, insomnia, fear, manias, stagefright. Improve your memory and concentration. Private and class instruction available at Institute. Complete practical home-study course. . . . $2

POWERS INSTITUTE OF HYPNOTISM 1324 Wilshire Blvd. Dept. 28, Los Angeles 14, Calif.



FIX SEWING MACHINES

BIG MONEY. Spare or full time. Open your own neighborhood shop. Thousands need repairs. Send for complete Repair Manual—only $1.98 postpaid. Money back guarantee.

SEWING MACHINE SERVICE CO. Hamilton 28-L, Ohio.

STAY HOME AND MAKE MONEY!

—Men! Women! Get into profitable, uncrowded profession you can operate from your home or small office after short home training course. No capital required. No goods to buy. No age limit. Others earn $50.00 to $100.00 per week making famous Stephenson corrective foot devices to order. Foot sufferers everywhere pay gladly for relief. Send today for FREE BOOKLET.

STEPHENSON METHOD, Established 1894, 12-82 South Market St., Boston, Mass.

DETECTIVES

Home Study in Detective Training—Professionally Modernized—Recognized Instructors—Easy Payments—Write

INTERNATIONAL DETECTIVE TRAINING SCHOOL
1701-P Monroe St. N. E. Washington 18, D. C.

PILOTS' JACKETS

(Left) **NEW AIR-CORPS** B-15 Style. Green poplin. Warm alpaca wool pile lining. Genuine Mouton fur collar. 4 Pockets. 36-46 . . . **$15.50**

(Right) A-2 Style. Brown leather, sturdy rayon lining. Zipper front. Sizes 34-46 . . . . . **$17.95**

NAVY N-4 JACKET: Water repellent green poplin. All wool flannel lining. Zipper front. Sizes 34-36 . . . . . **$5.50**

Write for FREE Illus. List Army Surplus. Orders sent postpaid except C.O.D.

Satisfaction or Money Back
CONSUMERS CLOTHING CO., Box S, 26 Greene St., New York 13, N. Y.

The Books They're Talking About

DRAWING THE

Female Form

Get these thrill packed new art studies of curvaceous, glamorous art models, photographed in color in life-like poses, showing every contour of the body from head to toe. Draw each revealing curve and pose, just like a professional. Excellent for students of Art Anatomy and figure drawing.

Comes in two separate volumes. Vol. 1 and Vol. 2. Price each..... **$1.50**

Outside U.S. send $1.75 each.

MAJOR BOOK CO. Dept. B3, LYNBROOK, NEW YORK

Get Training *QUICK* in the Great Shops of COYNE

Learn **ELECTRICITY** in a few weeks

NOT a "Home-Study" Course!

Practical training pays! Thousands of successful electricians—men earning good money, with steady jobs and a real future—recommend the COYNE Shops in Chicago. We do not teach by mail. All instruction is given in our own big building in the heart of the World's Electrical Center. You make rapid strides here because it's a **shop** course.

Work on Full-Size Equipment!

In our great shops you actually operate, test, repair the same kinds of electrical apparatus you'll use later on the job. You do REAL house wiring; rewind REAL armatures; run a REAL switchboard. All this plus needed theory makes it easy to learn Electricity in a few short weeks here at COYNE.

No Experience Necessary

Many **Coyne** students have never had previous electrical experience. Others have had a smattering of it in one or two branches, but realize their need for "All-Around" training. We not only train you for a good job, we help you get it. **Lifetime Free Employment Service** to **Coyne** graduates.

SEND FOR FREE BOOK

Yours for the asking—big 40-page book on **Coyne** Electrical Training. Filled with fascinating pictures of our great shops and our plans to help you. Get your copy free. No cost or obligation; no salesman will call. Mail the coupon today!

COYNE Shop Training Includes:

Alarm and Signal Work
D.C. Motors, Generators, Controls
A.C. Motors, Generators, Controls
House Wiring
Armature Winding
Stator Winding
Transformers
Switchboards
Home Appliances
—and many other branches including added training in **Industrial Electronics** and **Electric Refrigeration.**

NOW IN OUR 49th SUCCESSFUL YEAR

B. W. Cooke

Since 1899, **Coyne** has been training men and young men for practical, better-paying jobs. Here in our great Chicago Shops you will find the equipment, the friendly expert instructors, to prepare you for a real future in Electricity. **Coyne** graduates are in demand by many leading electrical firms. **Coyne** men are trained to make good in their own electrical shops. Come to COYNE!

VETERANS!
Coyne is authorized to accept Veterans for G. I. training. Coupon brings special G. I. Bulletin.

NON-VETERANS who are short of cash can finance most of their tuition and pay it in easy monthly payments after graduation. Many students earn while learning. We'll help you get part-time work while here if you need it to help defray living expenses.

ANY MAN WITH A PHYSICAL DISABILITY whether a Veteran or not may qualify for **Coyne** training at no cost to himself for tuition or subsistence. Send coupon for details.

B. W. COOKE, President

COYNE ELECTRICAL AND RADIO SCHOOL
Dept. 38-73
500 S. Paulina St., Chicago 12, Ill.

B. W. COOKE,
President,
Coyne Electrical and Radio School, Dept. 38-73
500 S. Paulina St., Chicago 12, Illinois.

Send me your Free Book and tell me about your plans to help me —including Student Finance and added Training in Industrial Electronics and Electric Refrigeration. Mail coupon today.

NAME.....

ADDRESS.....

CITY.....STATE.....

INVENTORS

When you are satisfied that you have invented a matter of value—write me, without obligation, for full information as to what steps you should take to secure a Patent or Trademark.

The usual first step is to have a search of the prior U. S. Patents conducted, so that I can report to you on the question of Patentability.

PATRICK D. BEAVERS
(Formerly RANDOLPH & BEAVERS)
Registered Patent Attorney
937 Columbian Building, Washington 1, D. C.

PATRICK D. BEAVERS, *Registered Patent Atty.*
937 Columbian Bldg., Washington 1, D. C.
Please send me full information on how to secure Patents & Trademarks.

Name.....

Street.....

City.....*State*.....

Make More Money in AUTO BODY and FENDER REPAIRS

LOW COST
QUICK-EASY
The Help You Need!

233 Pictures—Diagrams
325 Pages of Vital Facts
Covers methods, tools, materials—How to get business—How to start your own shop. Latest information and pictures.

GET THIS BOOK NOW
In Your Own Home
Send No Money
FREE TRIAL

GET YOURSELF a share of the big money car owners are spending to keep their older cars looking good. This practical book will put you right into this profitable business. No experience needed. Get a good job or start a business of your own with little or no capital. Biggest selling book of its kind. Thousands in use. Mail coupon today—money back if not fully satisfied.

Mail Coupon

GOODHEART-WILLCOX CO., Dept. 33
2009 S. Michigan Avenue, Chicago 16, Ill.
Send Auto Body and Fender Repair, $3.50. If not satisfactory I will return in 5 days and you will refund money paid.
( ) Remittance enclosed, sent postpaid.
( ) Send C.O.D. Postage extra.

Name.....

Address.....

City.....State.....

Have an OFFICE of YOUR OWN!

LEARN NEW PROFITABLE PROFESSION
At Home in 60 Days, Men & Women, 18 to 70!

Be Your Own Boss and the Boss of Others. Be Respected. Meet Interesting People.

Earnings of men and women in this profession run as high as $5,000-$15,000 yearly. Others make good money in spare time. Little money needed to start. A business where your earnings begin sooner. Easy to learn. No selling or goods to buy. No experience necessary. A depression-proof business. A course of action to guide you step by step as you earn. All 53 lessons sent at once to use as operating manuals. Easy terms. Diploma. Money-back agreement. Write for **FREE BULLETIN.**

FRANKLIN CREDIT SCHOOL
Dept. 71-C ROANOKE 7, VIRGINIA

BY MAIL in *Easy Lessons*

Enjoy WORLD'S MOST FASCINATING HOBBY! SEND FOR FULLY ILLUSTRATED BOOK TODAY!

GET THE FACTS on model railroading! Learn how easily you can enjoy the favorite hobby of thousands of mechanics, business and professional men. Endlessly fascinating... scale model railroads look, perform amazingly like the real thing!

BOOK SHOWS HOW to get started. Leading authority gives easy steps in complete, 32-page beginner's manual. Profusely illustrated with photos, diagrams. Send 10c, coin or stamps, today! Address

MODEL RAILROADER MAGAZINE
Dept. 1615 Milwaukee 3, Wis.

BE A REAL ESTATE BROKER

FREE BOOK TELLS HOW

Start and run your own business *Quickly*. All phases of business taught in Home Study or Classroom—Both G. I. Approved. WRITE TODAY for Big Illustrated Book. **WEAVER SCHOOL OF REAL ESTATE, 15 East Pershing Road, Dept. PC, Kansas City 8, Mo.**

LEARN MOVIE PROJECTION THEATRE MANAGEMENT

The Motion Picture Theatre Business offers big opportunities for trained men. Get into a fascinating field with a promising future. Train at home in spare time. Free Catalog. Established 20 years.

THEATRE INSTITUTE, 305 Washington St., Elmira, New York

LOOK! FIN-DER SAX-SLING

NEVER SLIP OR KINK
HIGH SPEED ADJUSTING BALLBEARING
$1.50
AT ALL GOOD DEALERS
Mfg. by FINDER, San Diego, Calif.
NEW!

GORGEOUS GIRL ACTION PHOTOS

Shot by Special Speed Camera... one ten-thousandth of a second! Models of breath-snatching beauty captured in action. Unequalled, inspirational studies for artist & photographer.

PER SET (of six photos) only **$1.00**

Send $5.00 for 5 Complete Sets, and get extra large Special Surprise Photo FREE.

FOR BEST SELECTION...ORDER NOW!

NOVEL-ART DIST. Box 1107, Hollywood, Cal.

BE A BUILDING CONTRACTOR

Big Earning Opportunities

BUILDING CONTRACTING

FREE...

Important Information Telling How To Get Started.

LEARN ABOUT the HOME BUILDERS TRAINING INSTITUTE PLAN...

Essential facts whether you are a tradesman in the building field or whether you have no previous experience.

Action Going On Now in the Building Industry.

MAIL COUPON TODAY FOR FREE ILLUSTRATED BROCHURE

DO YOU WANT TO BE ON THE INSIDE IN THE BUILDING BOOM AHEAD?

■ Big years right ahead in Building. Right now eighteen million Americans who do not own homes are being educated to advantages to them in home ownership! Do you want to be on the inside in the building boom—where big money is made? This is your chance now. Learn about opportunities for Building Contractors whether or not you have previous experience in this field. Millions of dollars are going to be made in home and farm buildings, in construction of stores, garages, small industrial buildings.

BUILDING INDUSTRY NEEDS MEN WITH ORGANIZING ABILITY

■ The Building Industry uses men with organizing ability by the thousands in construction, supervision, management, sales. Properly trained men needed in production, distribution, finance, installation, marketing. Government estimates housing demand at 40 billion dollars!

PRACTICAL HOME STUDY TRAINING—EASY TO LEARN BY THIS PLAN

■ Home Builders Training Institute has developed a training program that makes rapid progress possible. Gives you the all around training you want to prepare you for your advancement. Modern methods making use of visual aid illustrations make it easy to learn. From very first lesson assignments the type of information provided is the kind that can be useful to a man taking part in building.

GET FREE INFORMATION NOW
MAIL COUPON—NO OBLIGATION

Others are preparing to get in now! Act immediately! To delay preparing yourself is certainly to put yourself at a disadvantage. The building industry is going forward rapidly. Fill out, mail coupon today. No obligation.

Home Builders Training Institute, Dept. DI-3

Billions for Housing Needs

According to a report called "America's Needs and Resources" made available by the Twentieth Century Fund, a capital expenditure of $85,000,000,000 to $87,000,000,000 would be needed to fulfill America's housing needs in the next few years.

The building boom will last for many years. Prompt action now will get you started now—will put you in line for a big-paying job or a business of your own.

FILL OUT—CUT OUT—MAIL TODAY

FACTS FREE for Men Who Want to Get Ahead

Home Builders Training Institute, Dept. DI-3
7050 N. Glenwood Ave., Chicago 26, Illinois

Send free illustrated Brochure and other information about Building Contracting.

☐ VETERAN ☐ NON-VETERAN

Name .....

Address .....

City ..... State .....

NOW! ALL 5 FAMOUS JOWETT COURSES - 1 COMPLETE MUSCLE BUILDING VOLUME! FOR ONLY 25¢ AND MY PHOTO BOOK OF FAMOUS STRONG MEN FREE!

LET ME PROVE I can make YOU

COMMANDO-TOUGH

OR IT WON'T COST YOU A CENT!

SAYS George F. Jowett WORLD'S GREATEST BODY BUILDER

GIVE ME 10 MINUTES A DAY

Learn My Time Tested Secrets Of Strength

I'll teach you the "Progressive Power Method" through which I rebuilt myself from a physical wreck the doctors condemned to die at 15, to the holder of more strength records than any other living athlete or teacher! "Progressive Power" has proven its ability to build the strongest, handsomest men in the world. And I stand ready to show you on a money back basis—that no matter how flabby or puny you are I can do the same for you right in your own home. Let me prove I can add inches to your arms, broaden your shoulders, give you a man-sized chest, powerful legs and a Rock-like back—in fact, power pack your whole body so quickly it will amaze you! Through my proven secrets I bring to life new power in you inside and out, until YOU are fully satisfied you are the man you want to be.

PROVE IT TO YOURSELF IN ONE NIGHT

Send only 25c for my 5 easy-to-follow, picture-packed courses now in 1 complete volume "How to Become a Muscular He-Man." Try it for one night! Experience the thrilling strength that surges through your muscles.

10 DAY TRIAL!

Think of it—all five of these famous courses now in one picture-packed volume for only 25c. If you're not delighted with this famous muscle-building guide—if you don't actually FEEL results within ONE WEEK, send it back and your money will be promptly refunded!

I am making a drive for thousands of new friends fast —REGARDLESS OF COST!

SO GET NOW MY 5 Muscle Building COURSES (Valued at $5 each)

All in 1 Great Complete Volume Packed With How-To-Do-It Pictures!

Now, this "get-acquainted," extremely low price of only 25c is your chance to build a body you'll be proud of! Follow Jowett's easy method of muscle building NOW!

For Only 25c

PHOTO BOOK OF FAMOUS STRONG MEN FREE!

Photos that inspire you to might and muscle. Free with order.

George F. Jowett Champion of Champions

FREE GIFT COUPON!

Jowett Institute of Physical Culture Dept. PS-83
230 Fifth Avenue, New York 1, N. Y.

George F. Jowett:—Please send by return mail, prepaid, FREE Jowett's Photo Book of Strong Men, along with all 5 Muscle Building Courses, 1. Molding a Mighty Chest, 2. Molding a Mighty Arm, 3. Molding a Mighty Grip, 4. Molding a Mighty Back, 5. Molding Mighty Legs—Now all in One Volume "How to Become a Muscular He-Man." Enclosed find 25c, NO C.O.D.'S.

NAME..... AGE.....
(Please Print Plainly, Include Zone Number)

ADDRESS.....

Attention CAMERA FANS

AMAZING BARGAIN OFFER

If you've never had the fun of "shooting little ones into big ones" with an Enlarger, you've missed Photography's biggest thrill. Perhaps you've been stopped by the high price of today's Enlargers. If so, the Enlarger you've been waiting for is MINILITE—fully assembled, painted, complete with baseboard and offered at the lowest price on today's market. The MINILITE Enlarger has all these deluxe features:

• Precision machined—aluminum alloy castings. • 90° tilt—for wall projections of prints—positive locking feature. • Helical rack and pinion focusing—extra large knobs. • Rotating glassless negative carrier—enlarges 35 MM to 2¼ x 3¼ negs.

FREE ILLUSTRATED FOLDER. full information, amazing low price for this assembled Enlarger.

CALIFORNIA TECHNICAL PRODUCTS CO.
D-3, 8510 Warner Drive, Culver City, Calif.

NU-WAY LAWN MOWER

Write for FREE Circular

Price $12.50 Why Pay More

Build Your Own Rotary Type Lawn Mower

We Supply Cutting Unit Complete.

NO INCREASE IN PRICE

TRACTOR-LITE MFG. CO., SPIRIT LAKE, IOWA

GOVERNMENT SURPLUS BRAND NEW

VICKERS CONSTANT DISPLACEMENT PISTON TYPE 1000 P.S.I.

HYDRAULIC PUMPS AND MOTORS

Hundreds of Practical Uses

BUILD YOUR OWN HYDRAULIC PRESS, ELECTRIC EYE DOOR OPENER, FARM EQUIPMENT, MIDGET CARS, ETC.

$15.00 F.O.B. DETROIT, MICH.

BENJAMIN SALES CO.
8774 Linwood Ave. Detroit 6, Michigan

Learn MECHANICAL DENTISTRY

To make Crowns, Plates, Bridgework, etc., for Dentists. Easy practical way to learn mechanical dentistry at home in spare time. FULL EQUIPMENT OF TOOLS AND MATERIALS INCLUDED WITH COURSE. Low tuition. Easy terms. Write for FREE BOOK about this money making profession that is not affected by the machine age.

McCARRIE SCHOOL OF MECHANICAL DENTISTRY
207 N. Broad St. Dept. 872 Philadelphia, Pa.

15 new OUTDOOR FIREPLACE Plans

Constructional details on 15 easy-to-build fireplaces ... simple fireplace from 60 bricks to deluxe job with multiple cooking units. Build on own grounds at small cost; enjoy sizzling steaks. Send dollar bill or check for plans now. Money-back guarantee.

HOMECRAFT PLANS Dept. S-118 7241 Madison Kansas City 5, Mo.

"the gun that looks and feels like a Luger"

HY-SCORE

World's Most Powerful AIR PISTOL

ACCURATE! FAST! HARD-HITTING!... Expensively made piston-type pistol for use by experts. No pumping. 30½ oz. 10¼" long. Cal .177 or .22. $19.85 for set including Hy-Score Pellets and darts*. Extra ammunition per box of 500 rounds $1.49 for Cal .177, $1.88 for Cal .22.

*When available.

Use HY-SCORE Pellets for best air pistol shooting.

If your dealer cannot supply, write for free booklet, Dept. PS-3

HY-SCORE ARMS CORP., BROOKLYN 1, N. Y.

NOTICE: As many replies will result from this announcement, it will help if you answer the questions below. B.L.M.

Learn EXPORT!

BIG MONEY IN FOREIGN TRADE BOOM

HIGH INCOME · *Travel* · ADVENTURE

If you are tired of looking forward to a life of humdrum, low-paid work in overcrowded fields, THIS IS FOR YOU! COMPARE World Trade's 18 BILLION DOLLAR VOLUME with anything else you've considered. LOOK in any telephone book under "Exporters and Importers" and see how few you find, compared to the "struggle to live" lines. You have room to prosper and opportunities for World Travel in Export-Import.

SALARIES UP TO $1000 A MONTH

...are common in World Trade. But—the sky's the limit in your own business. Commissions of $10,000 to $20,000 a year are quite possible. World Trade is almost three times that of the prewar thirties and now ready to break all records. Export-Import men and women are in big demand.

Buy For Others

Your customers in other lands tell you by mail or cable what they want. You buy it *for* them and *ship at their expense*. My course shows you how to get customers and how to find the goods they want.

Past Experience Unimportant

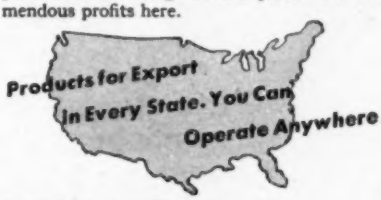
No previous experience or special schooling is necessary—only common school education. I teach you at home in your spare time by simple methods based on my own 25 years of practical experience. *You* use *my* experience. You can operate a World Trade business on a mountain top in Virginia or on the plains of Nebraska—in your own home—anywhere. You don't have to live in a city. Your customers are all over the world in this practical, profitable business.

I TEACH YOU AT HOME

I have trained others in as little time as one month because my methods are direct, free of non-essentials and red tape. You can start your own mail order World Trade business at home—on practically no investment.

Big Profits In Import Too

As you export, you receive opportunities to import. I give you practical lessons on how to handle this profitable business too. Many imported articles bring fabulous prices and tremendous profits here.



Practical—No Theory

I give you a BIG KIT of actual export documents and many other helpful guides—and a *full year's consultation service* even if you finish my course in one month. I even give you a list of *150 proven foreign representatives* to help get you started earning fast. A World Trade Certificate will be awarded you on successful completion. Other very special features I'll tell you about when you write me.

Start Today—Get FREE Details

Expansion of World Trade is at fever heat. Rush the coupon to me today for free details. The low cost of this course will surprise you. (No Salesman will call.) Air Mail reaches me over night.

B. L. MELLINGER, Director
THE MELLINGER CO., *Exporters—Importers*
1416-AA Westwood Blvd., Los Angeles 24, Calif.

MAIL COUPON NOW

B. L. Mellinger, Director, The Mellinger Co.
1416-AA Westwood Blvd., Los Angeles 24, Calif.
Please send FREE LITERATURE showing how I may enter the profitable career of World Trade.

Name _____

Address _____

City _____ State _____

Veteran? ____ Occupation? _____ Age? ____

Location preferred? _____

MANUFACTURERS with extra production capacity! Write for proof of how you may get profitable export sales. Describe products and volume available. Address Manufacturers' Division.

Put your future in your own hands

BE AN ARTIST

Here's the Amazing Way We Teach You Step-by-Step to Draw At Home in Spare Time

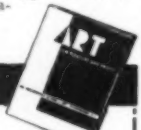
Draw for money. Prepare yourself now for a fascinating, pleasant and profitable Art Career. COMMERCIAL ART, DESIGNING, CARTOONING—all in one complete home study course. No previous art experience necessary. We teach you step-by-step and prepare you for good jobs in advertising, newspaper and magazine publishing, department stores, printers, engravers, or in art studios where you can become your own boss. For 34 years our graduates have been "making good"—WHY NOT YOU?

Trained Artists Are Capable of Earning

$60 - $75 AND MORE a WEEK

Write for FREE BOOK, "Art for Pleasure & Profit"—tells about our course, instruction service, material furnished, what our graduates say, and commercial opportunities for you. TWO ART OUTFITS and other features included with training.

Veterans! Course "G.I." Approved



FREE BOOK gives details!

Washington School of Art, Studio 133M
1115—15th St., N.W., Washington 5, D. C.
Please send me full information and your Free Book, "Art for Pleasure and Profit."

Name.....AGE.....
Street.....
City.....Zone...State.....

☐ I am entitled to training under the GI Bill

CONFIDENTIAL LOAN SERVICE

Borrow $50 to $300.00 BY MAIL

Need money? No matter where you live you can borrow **BY MAIL** $50.00 to $300.00 this easy quick *confidential* way.

IT IS EASY TO BORROW BY MAIL! Completely confidential and private. CONVENIENT MONTHLY PAYMENTS

NO ENDORSERS NEEDED

EMPLOYED MEN and women of good character can solve their money problems quickly and in privacy with loans **MADE BY MAIL.** No endorsers or co-signers. We do not contact employers, friends or relatives. Convenient monthly payments. Send us your name and address and we will mail application blank and complete details FREE in plain envelope. There is no obligation.

STATE FINANCE COMPANY
216 Savings & Loan Bldg., Dept. C-13, Des Moines 8, Iowa

BE A REAL ESTATE BROKER

PAYS BIG!

EASY TO LEARN—Start and run your own business *quickly*. Many graduates report making up to $1000 a month. Course of study covers *Sales, Property Management, Appraising, Loans, Mortgages* and hundreds of related subjects. Course offered in home study or residential classrooms.

FREE Big new illustrated catalog from this nationally known school. Send Post Card Today. G. I. Approved.

WEAVER SCHOOL OF REAL ESTATE
Dept. PS. 15 E. Pershing Road Kansas City, Mo.

BREAK or TRAIN DOGS

Keep your dog from running undesired game; train him to run any game wanted. Use Pete Rickard's Famous Dog Musks. Simple, Safe Sure. STATE YOUR PROBLEM for FREE information or include 1.00 for bottle which usually is enough. Complete instructions.

Satisfaction Guaranteed.

PETE RICKARD Dept. PS-3 Cobleskill, N. Y.

GARDEN TRACTORS

SPEEDEX AT BIG SAVINGS

12 Years proved service on large and small acreage. Complete line of implements to fit.

P-1047-32

WRITE FOR FREE BOOKLET

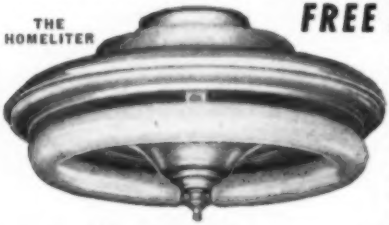
POND GARDEN TRACTOR COMPANY
BOX 216 RAVENNA, OHIO

---

22 Big Money-Makers in a Single Line!

Amazing New Fluorescent Lights with *CIRCULAR TUBES*

THE HOMELITER



FREE SALES OUTFIT

• Don't send a penny. Sample Outfit is FREE. Rush name on penny post card for money-making facts about sensational new "CIRCLINE" Fluorescents. Latest scientific development gives you **22** new type circular tube fixtures for kitchens, dinettes, halls, and play rooms. Also Floor and Table lamp for living rooms and pin-ups for shaving and vanity tables. Sells on sight to homes, restaurants, stores, offices. No other fluorescents like CIRCLINE. Salesmen who order samples quickly reorder in large quantities. **All fixtures complete with tubes.** No waiting. Also **immediate delivery on all standard type Fluorescent Fixtures.** This is too good to miss. Big, quick profits waiting. Rush name on post card today for FREE Sales Outfit.

NEW MAXILUME PIN-UP MIRROR LIGHT

MAXILUME COMPANY • 125 W. Hubbard • Dept. 93 • Chicago 10, Illinois

TWO-WAY COMMUNICATION *For* EVERYBODY !!

GENERAL ELECTRIC BC 645 TRANSCEIVER

10 times as powerful as a walkie talkie

A brand new two-way communication set which cost the Army over $400.00 and is ideal for two way communication between house and cars, office, service trucks, ambulances, boats, etc. Range up to 15 miles in the 450 to 500 Megacycle band. Operates in the new citizens band. Supplied complete with 15 tubes and conversion instructions to operate from 110 V A.C. Add postage for 25 pounds.

ACCESSORIES NEEDED

PE101C Dynamotor for 12 or 24 Volt storage battery operation $3.95
110 V A.C. Power Supply to operate BC 645 from house current $11.95
T-32 Table Microphone $2.95
Microphone Transformer $1.00
5" PM Speaker for BC 645 $2.80

$14.95 2 for $27.

GN58 GENERATOR

Makes excellent home lighting plant, operated by wind propeller, waterfall, gas engine, or hand crank. Reduction gear allows full output at slow speed; supplies 6 volts at 2.45 amp., 425 volts at .115 amp. New. Add postage for 28 lbs. **$7.95**

DYNAMOTORS

$1.95 An electric motor operating a generator on same shaft—hundreds of uses—gives high voltage from storage battery.

$5.95 Dynamotor C—Input 28 volts, output 220 volts at 60 MA. Add postage for 6 lbs.

$5.95 Dynamotor A—Input 12 volts, output 1000 volts at 350 MA. Shipping weight, 72 lbs.

Dynamotor B—Input 6 or 12 volts, output 500 volts at 160 MA. Shipping weight, 30 lbs.

BRAND NEW ARMY AIR FORCE

ASTROGRAPHS With Case

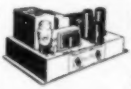
Only **$3.95**

New B29 navigation instrument which can easily be used to make a good contact printer, strip map holder, etc. The plywood case 14½"x11"x10" high is perfect as a tool kit, camera, projector case or for building a portable phonograph, picnic kit, make up case, etc., has leather handle reinforced covers, 8 covered compartments in bottom. Cost Gov't $125.00. Add postage for 20 lbs.

ASTROGRAPH FILMS

7½° S. to 37° S. 23½° N. to 8° S. Your Choice
68½° to 54¼° N. 28° S. to 45° S. **$2.50** Ea.

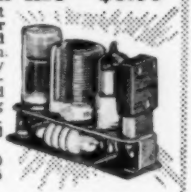
HEATHKIT AMPLIFIER KIT



Complete kit INCLUDING TUBES and 110 V A.C. 60 CY TRANSFORMER to build a high fidelity amplifier for radio, phonograph and public address use. Has two preamplifier stages and push pull phase inverter output using 1619 (military type 6L6) tubes. 25 Watt output. With complete parts and instructions. Add postage for 25 pounds.

$14.95

MIDGET TRANSMITTER KIT $3.95



Complete kit to assemble a 1 Watt battery operated amateur 80 meter transmitter including tube and crystal. Range up to 500 miles. An ideal beginner's kit. Uses Army parts all brand new. Only accessories needed are sending key and batteries. A complete transmitting station for only a few dollars. Complete instructions supplied. Add postage for 2 pounds.

Key—add post. for 2 lbs. $1.00
Batteries—add post. for 4 lbs. 3.25

MINIATURE HEADPHONES

$1.00 Hearing aid type, comfortable, keeps out outside noise, one of the army's best types. Add postage for 2 lbs.

T32 TABLE MICROPHONE

One of the army's finest built by Kellogg. Ideal for public address, transmitters, etc.
Add postage for 5 lbs. **$2.95**

RADIO BUILDERS' KITS

Power supply kit to convert to army radios 110 VAC $5.95
5" P.M. loudspeaker for army radios $2.80
Experimenter's Kit, 5 lb. of radio parts for $1.00
Kit of 20 radio tube sockets for $1.00
Kit of 20 Bypass bathtub condensers $1.00
Kit of 10 radio volume controls $1.95
Kit of 10 Midget variable condensers $1.95
Kit of 100 color coded insulated resistors $1.95

RADIO SHOPS write for Free literature on Heathkit service instruments.

G. E. CIRCUIT BREAKER

$2.95 Protect your electrical equipment, eliminate fuses. 50 AMP 220 Volt rating. Add postage for 4 lbs.

THROAT MICROPHONE

Used by army in noisy applications in aircraft, tanks, etc. Many interesting home uses.
Add postage for 1 lb. **$1.00**

G.E. BC375

TUNING UNIT

A beautifully constructed tuner containing the best in variable condensers, coils, vennier dials, etc., at least $30.00 worth of parts, complete with conversion instructions to transmitter and receiver. Add postage for 20 lbs. **$2.49**

MINIATURE MOTOR

24 V. D.C. size 1¼"x1"x2"
Add postage for 1 lb. **$2.95**

POWER SUPPLY KIT to convert motor to 110 V. A. C. Add postage for 6 lbs. $2.49

No Orders Under $2.00

Add postage for weight shown. Write for Flyers listing hundreds of other electronic bargains.

The HEATH COMPANY

DEPT. S . . BENTON HARBOR, MICH.

LINGUAPHONE

is your Passport to the World

In your own home, alone or in a group, you can now learn to speak

SPANISH • PORTUGUESE
FRENCH • RUSSIAN
ITALIAN • GERMAN

or any of 23 other languages by the world-famous

LINGUAPHONE
Conversational METHOD

You learn the new language by listening to voices of native teachers. It is amazingly simple; thousands have succeeded. Educators hail Linguaphone as a notable advance in simplifying the mastery of languages. That is why so many Linguaphone Sets are used in schools, colleges, universities, as an aid to *fluent* speaking.

Available to Veterans under G I BILL OF RIGHTS

SEND FOR FREE BOOK
LINGUAPHONE INSTITUTE
95 RCA BUILDING, NEW YORK 20, N. Y.

LINGUAPHONE INSTITUTE
95 RCA Bldg., New York 20, N. Y.
Send me the FREE Linguaphone Book.
I am ☐, am not ☐ a World War II Veteran
I want to learn.....language.
Name .....
Address..... City.....

Save Money! **Protect Your Ignition Parts!**

SHORT-STOP
NEW IGNITION SEALER

Now you can avoid costly replacements in your ignition system by making parts thoroughly **moisture-proof**. No more shorting out due to rain, sleet, snow, excessive humidity, condensation or radiator overflow! All you need do is apply a small amount of **SHORT-STOP**—the new liquid ignition sealer—to exposed parts and you have full protection for a minimum of 6 months!

SHORT-STOP is guaranteed to protect your spark plugs, ignition wires, spark coil, distributor cap and base, generator, battery cables and terminals. **SHORT-STOP** has been **tested** by leading electrical laboratories and **proven** thru extensive use on automobiles, inboard-outboard motors, airplane engines, tractors, Diesel equipment, motorcycles, model airplanes and household motors.

Keep power in—keep moisture out . . . order your bottle of **SHORT-STOP** now! Send $1.00 for generous 4 ounce bottle. **MAIL COUPON TODAY!**

CARDINAL CHEMICAL CO., HAWTHORNE, NEW JERSEY
Please rush to me postpaid.....
bottles of **SHORT-STOP.** Enclosed is $.....
Name.....
Address.....
City.....Zone....State.....

The Amazing **INTER-TALKIE** *new*

FOR OFFICES, STORES, HOMES, FARMS LOWEST COST—EASIEST TO INSTALL!
Beautiful Black Silver or Walnut Silver plastic cabinets! Wt. only 3 lbs! SETS ON ANY DESK-TABLE or HANGS ON ANY WALL! SELF POWERED! NO HUM-HOWLING-TUBES OR ELECTRIC "PLUG-INS" NEEDED! No shocks. CLEAR ROOM VOLUME—NO EARPHONES! A REAL LOUDSPEAKING SYSTEM! ANYONE CAN HOOK THEM UP IN A MINUTE! Always Ready! Operates for 50¢ or less per year (average)

GUARANTEED FOR 3 YEARS

Just the thing for talking instantly between rooms, barn, garage, shop, to house, office, front door to kitchen, etc.—3 to 2,000 ft. apart! SAVES STEPS, TIME AND MONEY. Set of 2 with 50 ft. tiny wire and all instructions ONLY $19.95 complete (extra wire $1.00 per 50 ft) ORDER DIRECT. Send $3.00 deposit. Balance C.O.D. express on arrival (U.S.A. only). MONEY BACK GUARANTEE.
Also 3-6 station systems, $12.95 per station

PAKETTE RADIO CO., INC.
Dept. PS-3 KEARNEY, NEBRASKA

BUILDING CONSTRUCTION

with composition cement and cheap wood builds good 3-room house for $250; barns low as $50.00. 100 illustrations and 100 money and labor saving suggestions. Get this newly revised and enlarged, guaranteed book before you build. **$1.00,** postpaid. **SHEET METAL COTTAGES** and other buildings. Several new methods. Illustrated Instructions, **50c. FURNITURE OF COMPOSITION.** Cement, sawdust, asbestos, etc., scrap wood, metal, etc. Illus. **50c. SHOP MACHINES FROM OLD AUTO PARTS:** Over 60 described. **50c. HOME MFG. ENTERPRISE.** 50 home shop projects. Illus. **50c. Special: All five booklets described above, $2.00 postpaid.**

HOME INDUSTRIES, 1318 So. 30th Ave., Dept. 83, Omaha 5, Nebr.

HELP FOR INVENTORS

Hundreds of manufacturers have requested our assistance in locating marketable new products.

Complete information, free.

INSTITUTE of AMERICAN INVENTORS
Dept. 3, 1926 Eye St. N.W., Washington 6, D. C.

INVENTORS

Whether an invention is patentable can be substantially determined by a search of the U. S. Patent records. Without obligation, write for information explaining the steps you should take to secure a patent.

JOHN N. RANDOLPH
Registered Patent Attorney
205 Columbian Building, Washington 1, D. C.

PATENTS
AND TRADE MARKS
C. A. SNOW & CO.
REGISTERED PATENT ATTORNEYS
WRITE FOR INFORMATION TO
246 SNOW BUILDING, WASHINGTON 1, D. C.

FREE **MRS. BERRY'S POULTRY BOOK**

BABY CHICKS or STARTED. Champion-Mated, Licensed-Inspected, B.W.D. TESTED. **52 BREEDS, 6 HYBRIDS.** Sexed or straight. Mature fowls, Hatching Eggs and Remedies. **LOW PRICES. The ORIGINAL Berry's Farm**—over 50 years' service. **LARGE BEAUTIFUL BOOK FREE.** Stamps appreciated.
BERRY POULTRY FARM, Box 25, CLARINDA, IOWA

INVENTORS

IF YOU WISH TO PROTECT YOUR INVENTION,
You should take steps to protect it by a U. S. Patent. Write me for "Record of Invention" form.

CARL MILLER
REGISTERED PATENT ATTORNEY

Woolworth Bldg., 35th Floor, Dept. 38-C, New York City
Please send me "Record of Invention" form.
NAME.....
ADDRESS

Now ANY AUTO REPAIR JOB Can Be "Duck Soup" For You!

MoToR's New AUTO REPAIR MANUAL Shows You How to Service and Repair ANY Part of ANY Car!

FREE 7-DAY OFFER!

NOW you can "polish off" the HARDEST jobs the EASIEST way! MoToR's AUTO REPAIR MANUAL is ready to show you how to repair anything from carburetor to rear end—with the least possible amount of time and effort!

Suppose plain-talking car engineers from every auto plant in America got together and showed you all the things you needed to know about repairing and servicing the cars they had designed and manufactured! That's really what you get in this big manual! Right at your fingertips, the main "dope" from over **150 Official Factory Shop Manuals,** covering every make car built since 1935!

Easy to use, too! Quick-index leads you to right page in jiffy! Just follow simple instructions step-by-step.

SEE HOW MUCH YOU GET!

Over 700 pages, 8½ x 11 inches, bound in sturdy covers. 200,000 service, repair, adjustment, replacement, tune-up facts on all makes and models, built from 1935 to 1948! More than 1700 cutaway photos, diagrams drawings show you exactly WHAT to do and HOW to do it. Used by U. S. Army, trade and technical schools everywhere, thousands of auto servicemen.

Now YOU — without cost —can see for yourself what a wonderbook MoToR's Auto Repair Manual really is. Try it—FREE—for 7 days! Learn first-hand how it can pay for itself the first few times you use it.

SEND NO MONEY

7-Day Free Examination

Just mail coupon at right, without money! When the postman brings your book, pay him nothing. First make it show you what it's got! Unless you agree this is the greatest time-saver and work-saver you've ever seen —return book in 7 days and pay nothing. Mail coupon today! Address: MoToR Book Dept. Desk 2C, 572 Madison Ave., New York 22, N. Y.

Published by MoToR, The Leading Automotive Business Magazine. MoToR's manuals assure high standards of repair work.

Covers All These Makes!

American Bantam
Auburn
Austin
Buick
Cadillac
Chevrolet
Chrysler
Cord
Crosley
De Soto
Dodge
Ford
Frazer
Graham
Hudson
Hupmobile
Kaiser
Lafayette
La Salle
Lincoln
Lincoln Zephyr
Mercury
Nash
Oldsmobile
Packard
Pierce Arrow
Plymouth
Pontiac
Reo
Studebaker
Terraplane
Willys

Clear, Pictured Facts on Every Job on Every Car Built Since 1935!

Nearly 200,000 service and repair facts on all 32 makes. Over 700 big pages; including 70 pages of carburetor text, charts, illustrations, covering all models. Over 200 charts, tables; Tune-up Chart; Valve Measurements; Torque Wrench Reading; Starting Motor; Engine Clearances; Generator; Body Service; Dash Gauges; Brake Specifications; Front End Measurements, etc., Engines; Electric, Fuel, Cooling, Lubricating Systems; Transmissions; Universals; Front Ends; Wheels; Rear Ends, etc.

Same FREE 7-Day Offer Applies on MoToR's TRUCK REPAIR MANUAL

For mechanics, truck specialists, service stations, fleet owners. Covers EVERY job on EVERY truck made since 1936! 1400 pictures, 962 pages, 300,000 facts. Used by Armed Forces.

All types Gasoline Engines, Diesels, Hesselman, Fuel Systems, Governors, Lubrication Systems, Ignition Systems, Starters, Generators, Clutches, Transmissions, Axles, Torque Dividers, Transfer Cases, Brakes, Steering, etc.

ALSO SERVICES buses, farm and industrial tractors, contractor and road building equipment, stationary power machinery, etc. (on all parts described in Manual.) Check box in coupon at right.

MAIL COUPON NOW FOR 7-DAY FREE TRIAL

MoToR Book Dept., Desk 2C, 572 Madison Ave., New York 22, N. Y.

Rush to me at once: (check box opposite book you want).

☐ **MoToR's AUTO REPAIR MANUAL.** If O.K. I will remit $1 in 7 days (plus 35c delivery charge), then $2 monthly for 3 months, with a final payment of 95c one month later. Otherwise I will return book postpaid in 7 days. **(Foreign price, remit $8 cash with order).**

☐ **MoToR's TRUCK REPAIR MANUAL.** (Described at left.) If O.K., I will remit $2 in 7 days, and $2 monthly for 3 months, plus 35c delivery charges with final payment. Otherwise I will return book postpaid in days. **(Foreign price, remit $8 cash with order).**

Print Name _____ Age _____

Print Address _____

City _____ Zone No. _____ (if any)

State _____ Occupation _____

☐ **Check box and SAVE 35c delivery charge** by enclosing WITH COUPON entire payment of $5.95 for Auto Repair Manual (or $8.00 for Truck Repair Manual). Same 7-day return-refund privilege applies.

ELECTRICIANS

Get this Great Book **FREE**

For Merely Examining Coyne's NEW Pay Raising

8 Volume Set APPLIED ELECTRICITY

Here's a *brand new* set of electrical books to give you the "know how" on all branches of electricity from appliance repairing to D.C. and A.C. equipment, electrical refrigeration, Industrial Electronics, etc. 3,400 subjects, 11,000 facts, latest methods explained in easy to follow instructions. To prove how valuable and Practical this set can be to you, I'll give you *a Book copy of my book "150 Shop Prints and How to Read Them" just for looking over this set.* Written by the Coyne Staff and backed by 47 years' experience, this set has helped many ambitious electrical workers to *bigger pay and added opportunity.*

OFFER LIMITED • ACT NOW! If you act promptly, I'll send you the 8 volume set Applied Practical Electricity for 7 days FREE examination . . . together with the 150 Shop Print Book. Look the set over 7 days. If you like it send either $22.75 cash or $2.00 after 7 days and $3.00 per month until $24 is paid. If you don't want the set, return it and YOU OWE NOTHING. *In either event you keep the 150 Shop Print Book absolutely FREE.*

Coupon below is just a request to see the books free and to get my gift book for doing it. ACT—Send coupon Today!

Technical Bpk Div. **COYNE ELECTRICAL SCHOOL**
500 S. Paulina St., Dept. 38-R8, Chicago 12, Ill.

FREE Book Coupon

SEND NO MONEY

B.W.Cooke, Director, COYNE ELECTRICAL & RADIO SCHOOL
500 S. Paulina St., Dept. 38-R8, Chicago 12, Ill.

O. K. send me, postpaid, Coyne's new 8 volume "Applied Practical Electricity" for 7 Days FREE TRIAL per your offer. Also send, absolutely FREE, the book of 150 Shop Prints as a gift.

Name ..... Age .....

Address .....

Town ..... Zone ..... State .....

Woo-Wee wolf whistle AUTO HORN

Reproduces "Wolf Whistle" better than any sedan. Screeches, barks, whistles, imitates siren, moves any road hog off the highway in double quick plus. Attract more attention than by driving a yellow Cadillac. Operates from manifold. Installed on any car in 15 minutes. Sturdily constructed. Cleverest novelty since the use of the auto. Be the first user in your neighborhood. Dealers wanted. Absolute money back guarantee. Exclusive each. Order today. Ohio orders add 3% tax.

THE PROTECTUROD COMPANY - Dept. 102
4033 Windsor Road - Youngstown 7, Ohio

PRESTO! ANYONE CAN MASTER GLAZE

Car Owners! Meet Master Glaze—the sensationally different luster for new and used cars! Not a wax—not an oil polish—not a paint!—nothing that "smears" over the surface. **MASTER GLAZE** is a unique discovery—a creamy liquid—quick and easy to apply! Gives a hard, glass-like surface. Even gasoline cannot dull it! Lasts six months to a year! Amazing luster—beautiful, sparkling clean and brilliant! Doesn't finger-mark—doesn't smear! A match box full glazes an entire car. Seals the pores—protects! NOTHING LIKE IT!

AGENTS An unusual opportunity! Quick, flashy demonstrator. Big profits. Good territory. Write today!

FREE SAMPLE
Just send your name and address to
MASTER GLAZE CO., 7720-645 W. Harwood Ave., Milwaukee, Wis.

NEW EASY WAY TO MAKE MONEY at HOME

YOUR COST ONLY 5c YOU GET $5.00, FULL OR SPARE TIME.

It's easy to Bronze Baby Shoes. Business still in infancy. Get in on ground floor and skim cream of profit from rich and never-ending market. No experience needed. **Learn in one week.** Income up to $1,000 a month full time—$50 to $75 weekly in spare time. We furnish complete kit and full instructions. So easy to understand that a 12 year old can become **expert.**

FREE FACTS. Write today. Don't send a penny. Just name and address in letter or postcard. Be the first in your territory to reap rewards waiting. Costs only 5c to bronze shoes. Sell for $5.00! This is too good to miss. Get facts today. Write to

KIKTAVI COMPANY, Dept. 19
8620 So. Rutheien — Los Angeles 44, California

MAKE GOOD MONEY

AMERICA'S LEADING OIL BURNER INSTALLATION AND SERVICE SCHOOL

LEARN OIL BURNER INSTALLATION AND SERVICE at one of America's finest institutions. Our 12 week course qualifies you to be an expert oil burner service man. No previous experience necessary! We teach you with tools and actual working machinery. Approved for G.I. training. Write today for Booklet T.

AIR CONDITIONING & REFRIGERATION INSTITUTE
110-112-114 N. Paca St. — Baltimore 1, Md.

LAW

STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction—over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. Send for FREE BOOK.

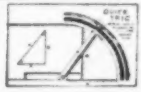
AMERICAN EXTENSION SCHOOL OF LAW
Dept. 87-S, 646 N. Michigan Ave., Chicago, Ill.

Learn MASONRY CARPENTRY

Write for "Free" Catalog

Make big money in the building trades. Learn now while opportunities are greatest. Train in our well equipped shops. Approved for Veterans. **MIDWEST SCHOOL OF BUILDING TRADES, Dept. A2-3, 411 N. Center Street, Bloomington, Ill.**

LEARN TRIG QUICKLY—EASILY



WITH QUICK TRIG, by competitive tests, it was found that QUICK TRIG gave answers faster to one with a slight knowledge of trig than to an expert on trig with a slide rule. Let it solve your trig. problems. You need no previous training. Entirely automatic. Easy instructions included FREE. We mail C.O.D. plus postage or send $1.00, the full price, and we mail postpaid.

REED MFG. CO., 11350-P Burbank Blvd., N. Hollywood, Calif.

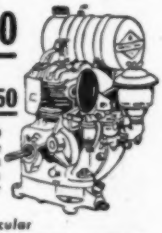
Say You Saw
It In Popular Science

BRIGGS-STRATTON ENGINES

1½ Hp Model N—Govt. Surplus

Special Low "as is" price Only..... **$34.50**

In good operating condition with 30 day written guarantee..... **$44.50**



Engines will develop almost 2 Hp at 3600 RPM. Hurry, don't wait, buy now while limited supply lasts. Suitable for lawn mowers, garden tractors, motor bicycles and scooters, midget cars, etc. Will power many kinds of machinery.

Write for Descriptive Circular

MIDWEST SURPLUS SALES CO. 1320 Locust St. Kansas City, Mo.

a small investment will establish you in . . .

Your OWN Business

Write For **FREE** *Booklet*

We are NOW enlarging our organization of U.S.A. and Canadian **DURACLEAN** dealers, in territories still open. Here is an opportunity to **BE YOUR OWN BOSS . . .** to become financially independent with a business of your own!

You become a fabric specialist, providing the proper cleaning and moth protection for upholstery and floor coverings. You use the proven, successful methods of established dealers. Service is rendered right **in the home,** office or public buildings without removing furnishings.

DURACLEAN Service was established **17 years ago** as an improved method for cleaning and revitalizing rugs and furniture. No harsh machine scrubbing, no soaking or shrinking. No inconvenience for your customers.

DURAPROOF makes fabrics and rugs **repellent** to moths, carpet beetles and mildew. You give a 4-year warranty of protection.

These services have a waiting market . . . a big repeat business. Profits up to $20. a day on **EACH** of your service men. Write today! A letter and 16 page illustrated booklet will explain everything.

- **No Overhead Expense**
- **No Shop Necessary**
- **No Experience Needed**
- **You Learn Quickly, Easily**
- **Short Hours . . . Large Profits**
- **Service Nationally Advertised**

Don't delay! Territories are limited. Remember, just a moderate payment, easy terms, and the opportunity to become financially independent in **YOUR OWN BUSINESS!**

DURACLEAN CO., 18-3CT St., Deerfield, Illinois

Say You Saw
It In Popular Science

THE GREATEST THING IN PLASTICS!

PLASTICAST

PLASTICAST is a liquid plastic; can be poured into ANY kind of mold or container. Hardens in a few minutes into a transparent solid, clear-as-glass, tough-as-steel plastic! No tools or machinery required. Ideal for imbedding flowers, butterflies, photos, souvenirs, and for making beautifully brilliant jewelry, gems, displays, fishing lures, magnifiers, lenses, knick-knacks and novelties. Easily cast into sheets, rods or blocks, ANY shape, ANY color. **EVERYTHING FURNISHED,** including 4 molds, for making over 200 attractive articles! Start manufacturing beautiful and useful plastics today—**no other equipment required!** C.O.D. orders accepted with $1.00 deposit.

COMPLETE MASTER OUTFIT Postpaid U.S.A. & Canada only **$3.25**

MULTIPLEX MOLD COMPOUND . . . simply pour over models to form solid flexible rubber molds in which ANY material may easily be cast! Nothing else like it! Good for thousands of castings; never wears out or spoils . . . may be remelted into new molds over and over again! Easily handles difficult shapes and undercuts. **Pound can, only** **$2.00**

FREE A very attractive and useful novelty made of one of our products given absolutely free with every one of our catalogs! Catalog lists many new materials for making **MOLDS** and **CASTINGS** with Liquid Plastics, Liquid Ivory, Liquid Marble, Wax, Latex, Metal, Castwood, Plaster, etc.; also many molds listed. Price of catalog only 10c coin or stamps.

PLASTICAST CO. (Dept. A)
(Send order to nearest office)

5961 Madison St.
Chicago 44, Illinois

P. O. Box 987
Palo Alto, Calif.

The Importance of Choosing a Long Established Technical Institute

Of utmost importance to anyone considering entering a technical institute, is that organization's history — also its facilities, faculty, and record of successful alumni. The Milwaukee School of Engineering, for 44 years has been training men for specific and substantial careers in industry. More than 35,000 former students now in industries the world over attest the career-building value of the Milwaukee School of Engineering, through its exceptional facilities in buildings, shops, laboratories, classrooms — and the comprehensive, practical technical courses under the supervision of its faculty of 72 specialists.

SPECIALIZE IN 6 MONTHS TO 3 YEARS

COURSES

SERVICE
6 to 12 Months
- Electricity
- Welding
- Refrigeration
- Heating

TECHNICIAN
1 to 2 Years
- Electricity
- Radio
- Electronics
- Refrigeration, Heating and Air Conditioning

PROFESSIONAL
3 Years
- Electrical Engineering Bachelor of Science Degree

Major in Machinery or Electronics

Our time-tested CONCENTRIC SYSTEM enables you to build your career step by step. Each 6-month course is complete in itself, yet prepares you for advanced courses. You train as long as circumstances permit — until you reach the "top step" in your desired occupational objective. 1,538 students now enrolled from 48 states and 13 overseas countries.

Terms Start April, July, September

MILWAUKEE SCHOOL of ENGINEERING
A Technical Institute

MAIL COUPON TODAY!

Milwaukee School of Engineering, Dept. PS-348
N. Broadway and E. State, Milwaukee, Wisconsin

Without obligation, send me free booklet "Career Building" and more details on course in . . . . . .

Name . . . . . Age . . . . . .

Address . . . . . .

City . . . . . State . . . . . .

AUTO BOOKS ON APPROVAL

CAN YOU FIX IT?

These wonder books tell step by step HOW to make difficult repairs and adjustments, how to keep a car at maximum efficiency, including latest improvements in car design and operation. Engine troubles and how to correct them well covered.

4 BIG, THICK VOLUMES

Over 2700 pages, 2000 illustrations, wiring diagrams, etc., including Diesel engines. Beautiful modernistic, washable cloth binding.

SEND NO MONEY. Just mail the coupon for a complete set of 4 Big, Thick Auto Books. 20th Edition. Over 2700 Pages! Whether you are a mechanic or helper, expert or apprentice, auto owner or driver, take immediate advantage of this FREE EXAMINATION OFFER.

MAKE GOOD MONEY NOW HOLD A PERMANENT JOB

America wants its automobiles kept in good repair. Men with "know how" are in demand, at big pay. These books will help you get and hold an important job, or give you a chance to go into business for yourself now or later. Any man who half tries to improve himself can learn auto servicing and repairing by this quick reference method. Use the JIFFY INDEX to find easily understood answer to any auto problem. These wonder books prepared by eleven of America's great automobile engineers. Many hundreds of valuable illustrations. Send the coupon TODAY.

[A year's consulting privileges with our engineers now given with these books without extra charge.]

Vocational Publishers Since 1898

AMERICAN TECHNICAL SOCIETY, Dept. A320
Drexel Ave. at 58th St., Chicago 37, Ill.

I would like to examine your 4 Volume Set of Auto Books. I will pay the delivery charges only, but if I choose I may return them express collect. If after 10 days' use I prefer to keep them, I will send you $2 and pay the balance at the rate of only $3 a month until $24.80 has been paid. Include consulting service as offered above.

Name.....

Address.....

City..... State.....

Please attach letter stating age, occupation, employer's name and address, and name and address of at least one business man as reference. Men in service, also please give home address.

YOUR OWN PRIVATE

TELEPHONE

PRICE INCLUDES SETS FOR BOTH ENDS

2-WAY COMPLETE

Speak and hear even a whisper. Ready for communication between any 2 points up to 1 mile. Requires only ordinary wire. Safe in water. Use at home, at work, on farms. Kids love them. Come ready to use. No electricity or battery. Complete..... **$2.95**

HEAVY CAST SOLID BRASS

SHIP'S BELL

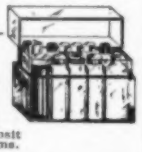
An exciting gift item, at a new low price. Weighs 3¼ lbs. Approximately 5" in diameter. Hang outside front door, decorate den, or boys' room, use in barbecue for chow calls. Only..... **$6.95**

15 Piece CHEMISTRY SET

Practical—Useful—Educational

Made for Chemical Warfare Division for testing water, etc. Complete set with chemicals, test tubes, full instructions. Packed in attractive lucite box, with cover and dividers. **$1**

CLEAR-VIEW



A chemically treated cloth. Stops fog and vapor on windshields, windows, etc. Prevents "steaming up" on bathroom mirrors, showcases, eye glasses, etc. Packed in metal container. **25c**

Send check or money order. One dollar deposit on all C.O.D.'s. We prepay postage on all items.

GENERAL SURPLUS CO.

221 So. Los Angeles St., DEPT. PS-38, Los Angeles 12, Calif.

FIREWORKS

CHINESE FIRE CRACKERS

1 Bundle or 1280—1½" Crackers..... $4.50
1 Bundle or 1600—1½" Crackers..... 5.35

BALLOONS—LATEX RUBBER

No. K 10, per gross..... $1.50
No. K 20, per gross..... 3.00

Write Dept. R for Wholesale Quotations.
Send Remittance with Order.

UNITED FIREWORKS MFG. CO., INC.
Dayton 7, Ohio

The American Institute of Specialized Watch Repair
270-276 East Building GRAND RAPIDS 6, MICHIGAN
A Fully Accredited School

You can learn that highly fascinating and profitable trade through this Institute, either at home by correspondence or at the resident school.

Earn While You Learn

Write for Free Circular

Learn
WATCH REPAIRING

ANALYZE HANDWRITING

Illustrated Lesson and Grapho Analyst FREE

shows you how to make money at home, full or spare time. Opportunities everywhere. **FREE Analysis Offer** for immediate answer. Must be over 21.

A.I.G.A. Inc., Wilhoit Bldg., Dept. 126-M, Springfield, Mo.

CORRESPONDENCE COURSES IN
RADIO and ELECTRICAL ENGINEERING

Tuition $25

ELECTRICAL ENGINEERING. Get good grasp of wide electrical field. Modern. Very understandable. Theory made easy. **RADIO ENGINEERING.** Extra fine course in radio, public address, photo-electric work. Trains you to be super-service man, real vacuum tube technician. **Tuition ONLY $25, either course.** Deferred payment plan. Servicemen needed badly.

FREE Write for free copies of school catalogs, student magazines, etc.
LINCOLN ENGINEERING SCHOOL, Box 931-S-111
LINCOLN, NEBR.

THERE'S MONEY IN
CARTOONS!

RAYE BURNS will teach you HOW to CREATE ORIGINAL CARTOONS at home that you may SELL! Course contains 26 lessons and over 600 illustrations. All for Only.. $2.85

Send name and address for free details.

RAYE BURNS SCHOOL, Dept. 8, Box 3583, CLEVELAND, OHIO

INVENTIONS

WANTED AT ONCE

Patented or unpatented inventions, all types needed by manufacturers. Write for free booklet "MARKETING YOUR INVENTION" and Protective Disclosure Form. We have a tremendous list of firms who may pay cash or royalties for good inventions. For full particulars, write today.

NATIONAL INVENTION SERVICE
1404 Mitchell Street, Dept. A Oakland 1, Calif.

---

3 In 1 AIR PISTOL

$3.49

SPORTSMAN JR.—Sensational, low-priced air pistol. Ruggedly built, full size target gun shoots either standard BBs, pellets or steel darts. Fast, single-action compression chamber. Single shot, **silent shooting.** Use indoors or outdoors. Modeled after famous target pistol. Economical to operate. Die cast all metal non-slip moulded grip; machined steel chamber and barrel. 8-in. long; 4½-in. deep; full size, weighs 15 oz. **EACH $3.49**

Shoots BBs Darts Pellets

BBs, 3 pkgs. 25c; .177 pellets, 500 for $1.50; steel darts, 35c package. (Holster 50c) Order Plenty.

No C.O.D.
JOHNSON SMITH & COMPANY, Dept. B-74, Detroit 7, Michigan

GET INTO DRAFTING

The Draftsman Plays a most Important Part in INDUSTRY

DRAWING OUTFIT INCLUDED
with Drafting courses.

All the tools you need including folding drawing table. With them you can put your ideas on paper quickly and with accuracy. With training you are all set to master Drafting in months, —not years—at home.

Learn in Spare Time—At Home!
(or at the College in Chicago)

A few hours of pleasant home study every week—that's all. With Chicago Tech's help, you train yourself step by step. This tested method—developed over 44 years of C.T.C. progress —prepares men for good positions in industry.

Practically everything that's built or manufactured these days is constructed from blue print drawings prepared by the draftsman. He is the KEY man in industry. No new machines can be built, no bridges erected, no buildings constructed until the draftsman has completed his work.

Drafting is clean, interesting, professional-type work. The draftsman is paid well to start. And he has real opportunities for advancement to high-pay jobs in Engineering. The tremendous production programs ahead in industry will require more draftsmen than ever before.

Send today for free information. See what this training has done for others, what it can do for you. Simply MAIL COUPON TODAY in an envelope or use a penny postcard.

CHICAGO TECHNICAL COLLEGE
C-225 Tech Building, 2000 South Michigan Ave.
Chicago 16, Illinois

MAIL COUPON NOW

CHICAGO TECHNICAL COLLEGE
C-225 Tech Bldg., 2000 So. Michigan Ave., Chicago 16, Ill.
Mail me FREE Drafting Lesson with information about big opportunities in DRAFTING and how I can train at home.

☐ Architectural Drafting ☐ Electrical Drafting
☐ Machine Drafting ☐ Structural Drafting
☐ Builders' Course

Name.....Age.....
Address.....
City.....Zone...State.....

IF YOU CAN HUM YANKEE DOODLE

YOU CAN LEARN TO PLAY YOUR FAVORITE INSTRUMENT

YES, if you can hum "Yankee Doodle", or any other catchy tune for that matter, and if you spend only a half hour a day following our Print and Picture instructions, in an amazingly short time you should be playing simple melodies.

It's a grand pastime learning music this easy home-study way. Instead of spending hours at tedious exercises, you *learn to play by playing* real tunes from real notes. You start with simple melodies. Gradually you go on to more difficult tunes. And soon you're delighted to find you can play many popular pieces by note. What's more, learning music this modern way is not only easy as A-B-C, but inexpensive, too—costs only a few cents a day, no matter which instrument you select. Surprise your friends—win new popularity – by learning your favorite instrument.

If interested, send for our Free Booklet and Print and Picture Sample. See how easy it is to learn music in spare time, without a private teacher. U. S. School of Music, 83 Brunswick Bldg., N. Y. 10, N. Y. (50th Successful year).

NOTICE!
Please don't confuse our method with any systems claiming to teach "without music" or "by ear." We teach you easily and quickly to play REAL MUSIC, any music, by standard notes . . . not by any trick or number system.

FREE! *Print and Picture Sample*

U. S. School of Music, 83 Brunswick Bldg., New York 10, N. Y.
I am interested in music, particularly in the instrument indicated below. Please send free booklet and Print and Picture Sample.
(Do you have instrument.....)

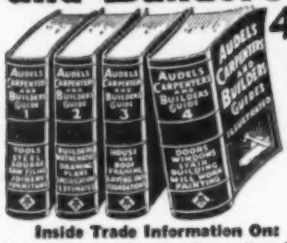
Piano	Piano Accordion	Reed Organ	Clarinet
Guitar	Saxophone	Tenor Banjo	Trombone
Violin	Trumpet, Cornet	Ukulele	Other Instrument

Name.....
(Please Print)
Street.....
City.....State.....
☐ Check here if under 16 years of age.

SAVE 2c—Stick coupon on penny postcard.

AUDELS Carpenters and Builders Guides

4 vols. $6



Inside Trade Information for Carpenters, Builders, Joiners, Building Mechanics and all Woodworkers. These Guides give you the short-cut instructions that you want—including new methods, ideas, solutions, plans, systems and money saving suggestions. An easy progressive course for the apprentice and student. A practical daily helper and Quick Reference for the master worker. Carpenters everywhere are using these Guides as a Helping Hand to Easier Work, Better Work and Better Pay. To get this assistance for yourself, simply fill in and mail the FREE COUPON below.

Inside Trade Information On:

How to use the steel square—How to file and set saws—How to build furniture—How to use a mitre box—How to use the chalk line—How to use rules and scales—How to make joints—Carpenters arithmetic—Solving mensuration problems—Estimating strength of timbers—How to set girders and sills—How to frame houses and roofs—How to estimate costs—How to build houses, barns, garages, bungalows, etc.—How to read and draw plans—Drawing up specifications—How to excavate—How to use settings 12, 13 and 17 on the steel square—How to build hoists and scaffolds—skylights—How to build stairs—How to put on interior trim—How to hang doors—How to lath—lay floors—How to paint

AUDEL, Publishers, 49 W. 23rd St., New York 10, N. Y.

Mail Audels Carpenters and Builders Guides, 4 vols., on 7 days free trial. If OK I will remit $1 in 7 days and $1 monthly until $6 is paid. Otherwise I will return them. No obligation unless I am satisfied.

Name _____

Address _____

Occupation _____

Employed by _____ P. S. M.

$ $ $ profits with FURNACES

SCALE HEAT furnaces. FULL Line, Gas & Oil Circulating heaters & Spot furnaces. Burners & Blowers. Of interest to Contractors & Builders. Dealers Franchises. Write for free details.
PEERLESS SALES, 4318 Sheridan Blvd., Lincoln 6, Nebr.

New Advertising Machine

PRINTS and ILLUSTRATES 1¢ POST CARDS

Send Coupon

CARDMASTER CO., 4546 Ravenswood
DEPT. 163, CHICAGO 40, ILL.

FREE!

Send FREE Illustrated Book* and complete, unique advertising plans and money making ideas for my business.

* Shows HOW thousands of business men in every line are boosting sales in spite of conditions with 1c messages printed and illustrated in few minutes on gov'nt post cards—with amazing, new, patented CARDMASTER. Your "today's" ideas, read by your prospects next morning. Not a toy, but a sturdy advertising machine built to last years. Sold direct at low price. Guaranteed five years. SEND NAME TODAY. All FREE!

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

$9.95 TAKES ALL THREE BIG BARGAINS

1. AUDIO AMPLIFIER. Undreamed of value. Uses 6V6's. Has 4 microphone inputs brought to jacks at rear panel. Various output impedances available at rear panel connections. Steel case with chrome handles. 9" long x 9" high x 6" deep. Tubes included. New in original carton. Shipping weight 15 lb. SUPER SPECIAL—$4.95 while supply lasts.

2. RADIO HEADSETS. Latest supersensitive type with rubber earpieces. Every pair guaranteed perfect. $.59 per pair OR 3 PAIPS FOR $1.00.

3. HOME WORKSHOP AT BARGAIN PRICE. Accurate and precise 2 speed guaranteed hobby lathe, the essential machine for the home workshop. Sturdy enough for light production work or factory standby service. Supplied with 56" of belting for connecting to any available electric motor or power take-off, such as on a jeep or tractor. Also included in this unbelievable offer are such accessories as a ½" drill chuck with specially hardened tool steel jaws, a 4" electric furnace high speed grinding wheel, a cotton buffing wheel with a large supply of buffing compound, and a 4" steel wire scratch brush. Your cost $6.00. Sole export agent. Distributor inquiries invited.

ORDER NOW—DON'T DELAY—NO C.O.D.s

BUFFALO RADIO SUPPLY 219 Genesee St. Buffalo 3, N. Y.

AMAZING SAVINGS JUST **OUT OF PAWN!**

GENUINE HIGH QUALITY **DIAMONDS**

UNREDEEMED DIAMOND PLEDGES DIRECT TO YOU! SAVE UP TO 50%!

Full cut genuine diamonds, expertly reset in beautiful modern mountings of 14 Kt. Yellow or White Gold (Ladies' or men's) priced at a small fraction of retail value. Over 100,000 satisfied customers. Iron-clad guarantee. Wear your diamond 7 days. Your money refunded immediately if not delighted. Order from this ad. Also write us for FREE illustrated catalog of other Unredeemed Diamond Pledges from $5.00 to $5000. Small deposit holds any diamond until wanted. Write us today. Bank Reference on request, or your own bank.

1/8 Carat ($125 Value)

$49.00

Tax Included

BERMAN'S COLLATERAL LOAN BANK
Dept. PS-S. 636-38 W. Balto. St. Baltimore-1, Md.

SHOE SHINES ARE COSTLY NOWADAYS

E-Z SHINE Shoe Holder

Home Shoe Shine Bracket Adjustable to men's, women's, children's sizes. Removeable. Money Back Guarantee.

$2.50

(You pay postage if C. O. D.)

Send check or money order and we pay postage

WAYNE MFG. CO. WAYNE PENNA., DEPT. P.S.

COMB-A-TRIM The New Quick Trimmer

Something New! Trim your hair without any experience. It's easy! The excess hair comes off smoothly and easily by just pulling trimmer through hair like an ordinary comb. Save on hair-cut bills. . . . Trim your own hair or the whole family's. Send 59c and your Comb-A-Trim will be sent at once, postpaid.

59¢

SPECIAL OFFER Send $1.00 for 2 Comb-A-Trims. Save 18c **2 for $1** 3 Extra Blades (Year's Supply) **25¢**

COMB-A-TRIM CO., CAREW TOWER, Dept. J-25, Cincinnati, Ohio

MICROSCOPES SUPPLIES-ACCESSORIES & SCIENTIFIC INSTRUMENTS

BEL SPENCER **NEW & USED** LEITZ ZEISS

BOUGHT-SOLD-EXCHANGED-REPAIRED

MEDICAL INDUSTRIAL AMATEUR

Send for FREE LIST

NATIONAL SCIENTIFIC INSTRUMENT CO 119 CHAMBERS ST NY 7

ACE Hollywood Experts WILL TRAIN YOU AT HOME
NOW YOU CAN MAKE GOOD IN

RADIO TELEVISION ELECTRONICS

THROUGH PRACTICAL EXPERIENCE WITH

10 BIG KITS of RADIO PARTS R.T.A. GIVES YOU!

YOU GET ACTUAL EXPERIENCE ON THESE 10 KITS

You perform more than 100 fascinating, valuable experiments. These jobs give you actual SHOP EXPERIENCE necessary to your success.

FILL OUT COUPON AND MAIL TODAY!

Opportunities Wide Open
400 MILLION new radio and television sets will be built within ten years. 72 MILLION dollars are being spent RIGHT NOW for radio repairs alone! When you are trained by RTA's Hollywood Experts, you too can qualify for big, interesting GOOD-PAYING technicians jobs, or YOUR OWN profitable radio repair business.

Extra Cash in Spare Time
RTA's Hollywood Experts show you how to earn welcome EXTRA CASH, while you learn. In fact, like many RTA students, you may actually get MORE spare time work than you can handle.

25 Years of Success
RTA's long years of experience assure you quickest progress. If you are at all mechanically inclined, RTA can teach YOU to MAKE GOOD in Radio-Television.

You Do Scores of Practical Experiments
Illustrated above are only a few of the many job-exercises you do, through RTA's "shop-type" home training method. You build a TRF Receiver, a High-Frequency Converter, a 6 tube AC-DC Superhet Receiver, plus dozens of other interesting jobs.

APPROVED FOR VETERANS

GET FACTS! SEND FOR FREE BOOK

Fill out the coupon TODAY and your FREE 30-page Radio-Television book will go out at once. No obligation. RTA APPROVED FOR VETERANS!

RADIO TRAINING ASSOC. OF AMERICA, DEPT. PSC
5620 Hollywood Blvd., Hollywood 28, Calif.
Send FREE BOOK showing how to make good in Radio-Television through training by Hollywood experts.

NAME_____ AGE_____
ADDRESS_____
CITY_____ ZONE_____ STATE_____
Check box if VETERAN of World War II ☐

How to Become a Good Penman
Free Book tells all
SEND 10¢ FOR MANUAL, CARD & GRADING PLAN
The Zaner-Bloser Schools of Penmanship F-439 Columbus 16, Ohio

---

LAWN ORNAMENT-NOVELTY PATTERNS
28 Lawn Ornament Patterns, 25c. Other patterns: 15-20" high; Dutch Girl, Dutch Boy, Pirate, Bull Terrier, Mexican Girl, Mexican Boy, Dwarf, Penguin, Flower Girl, 10c each. 25 Novelty Patterns, 30c. All 62 Full Size Patterns, $1.00 Postpaid. Strother Pattern Service, Dept. 7-AC, Box 383, Belington, W.Va.

BLISS ELECTRICAL SCHOOL

Electrical Training

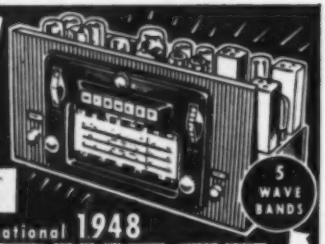
Intensive 32 weeks residence course in fundamentals of *industrial electrical engineering*, including radio and electronics. Extensive laboratory, shop work, drafting. Prepares for electrical technician and engineering aides in communications, power, manufacturing, business machines, sales, service. 54th year. Classes begin March 22; July 26. Catalog.

7604 TAKOMA AVENUE, WASHINGTON 12, D. C.

ROCHESTER'S world-famous industries WANT PATENTS

For further information, write to the Division of Public Relations, Rochester Department of Commerce, 54 Court St., Rochester 4, New York.

"A City of Rochester Service"



NEW SERIES 16 IMPROVED NO-DRIFT FM in the Sensational 1948 MIDWEST RADIOS

Separate Chassis Like the Powerful Series 16 AM-FM Above, or Beautiful Radio-Phono Consoles Available

The SYMPHONY GRAND RADIO-PHONOGRAPH AM-FM CONSOLE

A truly magnificent instrument that offers new, improved No-Drift FM, 5 Wave Bands, Automatic Intermix Record Changer that handles both 10" and 12" records, 14½" Panasonic Speaker, and exclusive Midwest Tri-Magnadyne Coil System and Color-Ray Tone Selection. Luxurious Cabinets. Other Console and Table Models with Series 16, 12, and 8 Chassis.

EASY TERMS — 30 DAYS TRIAL

SEND FOR FREE Catalog — BUY DIRECT FROM FACTORY AND SAVE

FILL IN COUPON AND MAIL TODAY OR JUST SEND YOUR NAME AND ADDRESS ON A POSTCARD.

MIDWEST RADIO CORPORATION
Dept. 24-U, 909 Broadway, Cincinnati 2, Ohio
Please send me your new FREE 1948 Catalog.

NAME .....
STREET .....
CITY ..... ZONE .... STATE .....

BE A SUPERVISOR

Franklin Technical Institute Helps Young People Get Ahead

• The door to well-paid supervisory jobs in industry is wide open — to the man or woman with specialized technical training. 50,000 graduates of this Boston school have gone out to good jobs in engineering and technical fields.

Practical courses in industrial electricity and electronics, industrial chemistry, mechanical and machine design, structural and architectural design, automotive service and management, electric wiring and maintenance. Also preparatory course. Approved for veterans. 40th year.

FRANKLIN TECHNICAL INSTITUTE
39 Berkeley St. Boston, Mass.
Please send free information on all courses.

Name _____ Age _____
Address _____
City _____ State _____

Try This NEW Portable

ADDING MACHINE

ON 10-DAY MONEY-BACK GUARANTEE

This ADDOMETER does more work at lower cost than any other ADDING MACHINE! Adds, subtracts, multiplies quickly, accurately; 8-col. capacity. Easy to use, easy to handle at desk, on the job or at home. Over 100,000 in use; praised everywhere. Yours for only $12.95 WITH 10-DAY MONEY-BACK GUARANTEE of not fully satisfied. Write for descriptive folder or send check or money order TODAY.

AMAZING VALUE ONLY $12.95

Dept. F-3, RELIABLE TYPEWRITER & ADDING MACHINE CO.
303 W. MONROE ST., CHICAGO 6, ILL.

HAUCK FLAME GUN KILLS WEEDS

2000° F controlled heat quickly, easily destroys seeds, roots, brush, poison ivy, wild morning glory, Canada thistle, other unwanted growths. Many uses: splitting rocks, burning stumps, sterilizing poultry houses. Burns kerosene. Does the work of 4 men. Safe, easy to use. 10 day trial. Satisfaction guaranteed. Free catalog.

HAUCK MFG. CO.
80 Tenth St., Brooklyn 15, N. Y.

BURIED TREASURE, MINERALS
AMAZING NEW GOLDAK LOCATORS

SENSATIONAL NEW MODEL!
ONLY 11 pounds weight! One hand operation! Money-Back Guarantee of Superiority. Write for full details.

THE GOLDAK CO.
1544 WEST GLENOAKS BLVD.
GLENDALE 1, CALIFORNIA

World's largest maker of fine locators.

SHOE REPAIR
OFFERS BIG INCOME
LEARN IN 12 WEEKS TIME

In 12 weeks time you can own your own shop or earn big income as skilled shoe repairman. Growing demand everywhere at top wages for men who know how. We teach you quickly by actually working on shoes and modern machines. Costs nothing under G.I. Bill of Rights. We help you get big pay job or start your own shop in 12 short weeks. School open to all from 18 to 60 years of age. FREE BIG 16 PAGE BOOK explains everything. Send for your copy today.

MODERN SHOE REBUILDING SCHOOL, *Established 1927*
2937 Belmont Ave., Chicago, Ill. RUSH POSTCARD TODAY!

BE FAIR TO YOUR HAIR Want better looking hair? Embarrassed by falling dandruff, itching scalp? Then try VITABRUSH, new electric driven scalp brush that gives your scalp a vigorous and invigorating "workout" in just three minutes of fun. Cleans scalp. Stimulates blood supply. Restful. Pleasant. Write *today* for complete information and satisfaction-guaranteed offer. Hershey Mfg. Co., 155 S. La Salle, Chicago 3

JOB NEWS

SHORTAGE OF ELECTRICAL WORKERS NATION-WIDE

GET QUICK TRAINING IN ELECTRICITY

VETERANS

Learn this great trade and get monthly subsistance on G.I. Bill at no cost to you.

In NATION'S LARGEST EXCLUSIVE ELECTRICAL SCHOOL

"LEARN-BY-SEEING" MOVIES + "LEARN-BY-DOING" METHODS

There's a place for YOU in a high-pay job or your own business. All-around M.T.I. shop experience gets you ready quickly. Learn HOUSEWIRING, A. C., D. C. MOTORS, ARMATURE WINDING, POWER PLANT WORK, ETC. Not a "Home Study" course. Friendly, skilled licensed instructors. New classes start every few weeks. Part-time work available. Living arrangements made.

MICHIGAN TECHNICAL INSTITUTE
Department PS-3, 2281 West Fort Street, Detroit 16, Michigan

MAIL TODAY: FOR QUICK ACTION

MICHIGAN TECHNICAL INSTITUTE, Dept. PS-3
2281 W. Fort St., Detroit 16, Michigan

☐ Send me catalog and complete information.
☐ I am a GI. Send special information.
☐ Married ☐ Single.

NAME _____
ADDRESS _____
CITY _____ ZONE ____ STATE ____

ARTISTS MAKE MONEY

Do you like to draw? Send name, address, age and occupation for FREE ART TEST, to find out your ability.

ART INSTRUCTION, INC.
3148 Art Instruction Bldg., Minneapolis 15, Minn.

STAMMER?

This new 128-page book, "Stammering, Its Cause and Correction," describes the Bogue Unit Method for scientific correction of stammering and stuttering—successful for 47 years. Benj. N. Bogue, Dept. 4826, Circle Tower, Indianapolis 4, Ind.

GET THIS FREE BOOK

LEARN MEAT CUTTING

EASILY - QUICKLY At Home-In Spare Time

The steady, dependable trade of Meat Cutting taught easily, quickly by improved HOME METHOD. National School, established over 25 years, has organized its famous "Learn By Doing" Classroom, Cutting room and Retail Market training system into sound, practical HOME STUDY form.

Now, by the miracle of this EXTENSION TRAINING you can prepare in Your Spare Time At Home, for a better job, bigger responsibilities or success and security in a store of your own. Remember, PEOPLE MUST EAT!

Buying, cutting, percentage, pricing, advertising, selling—a complete meat education. For beginner or men with experience. Thousands of successful graduates. Send coupon for FREE Bulletin NOW!

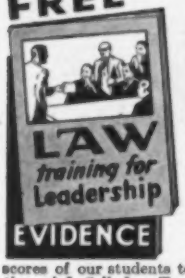
MAIL THIS COUPON TODAY FOR FREE BULLETIN

National School of Meat Cutting Div. 064, Toledo 4, Ohio

Send me your FREE Bulletin on Meat Cutting and Meat Merchandising. No obligation. No Salesman will call.

Name.....
Street.....
City.....State.....

FREE TO the MAN INTERESTED IN LAW



Every question about Law and its value to you is answered in LaSalle's 48-page booklet, "Law Training for Leadership." And the question of *how* you can master Law is answered in the companion booklet, "Evidence"—in which scores of our students tell how they have advanced through LaSalle Law Training in spare hours at home.

Legal training gives you what the business and professional world prizes highly and rewards liberally—a keen, analytical mind, the ability to judge shrewdly, talk convincingly, and act with confidence.

LaSalle's "Problem Method" of personalized instruction by lawyer-instructors gives you practice in handling legal problems . . . you *learn by doing*, not by memorizing rules. We guide you step-by-step, furnish all texts, including remarkable 14-volume Law Library prepared by leading law professors and lawyers, and used as reference in many Law libraries and offices. Degree of LL.B. conferred. Low cost, easy terms.

Investigate *your* opportunities in Law. Mail coupon today for free booklets described—without obligation.

LA SALLE EXTENSION UNIVERSITY
A Correspondence Institution
417 S. Dearborn St. Dept. 383-L Chicago 5, Ill.

Send me "Law Training for Leadership" and "Evidence"—without obligation.

Name.....*Age*.....
Street.....
City, Zone & State.....

VETERANS Learn WATCHMAKING

A Lifetime Career
No Age, nor Physical Limitations

YOUR OPPORTUNITY
To Lift Yourself from a Futureless Job

Approved G. I. Training

LEARN WATCHMAKING

and earn from the start, higher than average pay . . . easy hours . . . ideal working conditions . . . be prepared to establish your own business.

WATCH REPAIRING—JEWELRY—ENGRAVING
Always in Demand

Requests for our Graduates from Everywhere. Permanent positions (no layoffs) $75.00—$100 per week for trained men. Write today for latest FREE Catalog.

KANSAS CITY SCHOOL OF WATCHMAKING
America's Most Progressive Horological School
619 WYANDOTTE ST. KANSAS CITY 6, MO.

BE YOUR OWN BOSS! LEARN ELECTROPLATING

HIGHLY PAID FIELD

UNCROWDED, interesting business. Part or full time. Common school education sufficient. Chromium, Nickel, Silver, Gold, etc., money making trade secrets. Learn at home in spare time. *Send postcard today for* **FREE** *electroplating idea booklet.*

PLATER HYDE
432 F Street Room 522
San Diego 1, California

LEARN TO DRAW & PAINT

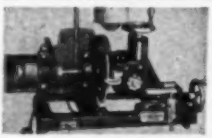
LANDSCAPES, PORTRAITS, FIGURES, ANIMALS.
No Previous Training Necessary

IF YOU LIKE TO DRAW YOU HAVE TALENT YOU CAN DEVELOP THAT TALENT THROUGH OUR HOME STUDY COURSE LEARN TO DRAW AND PAINT IN YOUR SPARE TIME. WRITE FOR INFORMATION.

JOHN CLINTON ART INSTITUTE, Inc.
STUDIO C PALM BEACH FLORIDA

HOW TO CUT RAFTERS

New vest pocket book gives lengths, side cuts, plumb cuts, deductions. For all rafters for any building from one inch to forty feet wide. Gives numbers to cut on square. Also degrees for same cuts for Radial Saws. All standard pitches from 1/8 to 5/8. Just open book to pitch page and there are your lengths, side cuts, etc. Anyone who knows what a jack rafter is can frame a roof if he has this great book. Price one dollar. ($1.25 in Canada). **Builders' Topics, Dept. S, Lock Box 828, Seattle, Washington.** CARPENTERS, PLUMBERS, PLASTERERS, ELECTRICIANS, ETC. subscribe for Builders' Topics, the monthly magazine for HE-MAN CONSTRUCTION WORKERS. Only $1.00 per year. (In Canada—$1.25). Sample copies 25c.



Start a NEW BUSINESS

Sharpen Dull Pipe Wrenches

Or Add to Your Present Repair Business

Write for information.

J. C. MOORE INDUSTRIES P.O. Drawer 276 FREDONIA, PA.

ZIRCONS

Loose. Pure white.

SPECIAL: 3 Zircons approximate total weight 3-kts. $3.00. We can supply Zircons in all sizes and mountings of all types. Send order or write for details today.

B. LOWE, Holland Bldg., Dept. PS, St. Louis, Mo.

EXCITING FILMS

Extraordinary and unusual 8-16mm. Silent and Sound Films to thrill your Home Movie Audiences.

For Sample Film and Special List send only 10c to...

EXCITING FILMS 1071 EL CENTRO HOLLYWOOD 38, CAL.

★ PSORIASIS ★

PSORIASIS SUFFERERS: Has everything failed to bring even temporary relief from scales, lesions and itching? Then write today for FREE important information. You needn't invest one cent!

PIXACOL CO., Dept. S-3, Box 3583, Cleveland, Ohio

Young Man! Now You're Out of School . . .
YOU WANT TO GET AHEAD—MAKE MONEY

Choose from these 5 Trades

They Offer High Pay — Lifetime Work — Security

AUTOMOTIVE & TRACTOR Covers all phases of mechanical training, tune-up service, trouble shooting, repair, latest types model motors used for projects. **34 WEEKS.**

DRAFTING Elements and technique, drafting geometry, construction plans and specifications, auxiliary elevations, every phase. **32 WEEKS.**

PLUMBING Every step, from pipe cutting and threading, lead work, home and industrial installations, worked out in our own plumbing shop. **34 WEEKS.**

ELECTRICITY Basic principles, magnetism, current electricity, residential and industrial wiring, appliance repair **34 WEEKS.**

SHOE REPAIR From simplest repairs on boots and shoes to the finest details of reconditioning and rebuilding, under expert craftsmen **39 WEEKS.**

"There's an Endless Demand for the Man Who Knows"

For YOUR lifetime career, learn one of these interesting and well-paid trades NOW. Be trained FOR the job, not ON it. All courses under especially trained instructors with practical experience 6 hour Classes 5 Days a Week Our Employment Department helps you

VETERANS — If you qualify for any of these finer trade courses, your tuition and subsistence is paid by your government! Limited Enrollments. Don't miss this Opportunity!

Mail Today!

National Trade School, Dept. C 2610 Grand Ave. Kansas City 6 Mo

Without obligation to me please send full information on the courses checked

..... Automotive and Tractor Technician ..... Drafting
..... Plumbing ..... Electricity ..... Shoe Repairing

Name ..... Age .....

Address .....

City ..... State .....

Veteran? .....

WHICH OF THESE *Opportunities* INTERESTS *You* MOST?

● *Today,* choose the job you want—and prepare for it. Or if you are already engaged in the work you like best, start training *now* for quicker promotion. Acquire the knowledge that will help you to get ahead faster, make more money and have greater security.

American School, founded in 1897 as an educational institution *not for profit,* can help you to reach your goal just as it has helped others during the past fifty-one years. Check the coupon at right, add your name and address and mail it at once. The school will send you details on its training plan and outline of study prepared by specialists. There is no charge, no obligation, so send the coupon immediately.

AMERICAN SCHOOL

Dept. G-346, Drexel at 58th Street, Chicago 37

CHECK, CLIP AND MAIL COUPON NOW

AMERICAN SCHOOL, Dept. G-346, Drexel at 58th, Chicago 37, Ill.
Without obligation, Please send FREE and postpaid, bulletin and details of the Subjects checked:

- ☐ PLASTICS ENG'R
- ☐ Refrigeration
- ☐ Architecture and Building
- ☐ Contracting
- ☐ Practical Plumbing
- ☐ Automotive Engr.
- ☐ Aviation Drafting
- ☐ Aviation
- ☐ Business Management
- ☐ Accounting
- ☐ Electrical Engr.
- ☐ Electricity-Pract.
- ☐ Electronics, Industrial
- ☐ Bookkeeping
- ☐ Private Secretary
- ☐ Diesel Engineering
- ☐ Sheet Metal Pattern Drafting
- ☐ Railway Training
- ☐ Drafting and Design for Men and Women
- ☐ Radio
- ☐ High School
- ☐ Air Conditioning
- ☐ Mechanical Eng.
- ☐ Shop Management
- ☐ Tool Making
- ☐ Better Foremanship
- ☐ Machine Shop Operations

Name ..... *Occupation* .....
Address ..... *Age* .....
City ..... *State* .....

PAINT YOUR CAR with WYPE for $3.95

Amazing NEW AUTO ENAMEL

You WIPE ON Instead of Brushing & Spraying

GET BEAUTIFUL MIRROR-LIKE FINISH THAT LOOKS LIKE SPRAY JOB! ONE QUART DOES ENTIRE JOB!

At last—you can paint your car with WYPE for $3.95 and get a beautiful, high-gloss finish that rivals an expensive, professional spray job. With WYPE you need NO BRUSH, NO SPRAY, NO MASKING! You just WIPE ON with Powder Puff furnished. Takes about an hour to apply. No streaks, no lap-marks. WYPE dries dust-free in one hour. Guaranteed for TWO years not to peel, chip, crack or fade, if simple directions are followed. Goes on over any other color, enamel or lacquer.

Dries to Glistening PROFESSIONAL Finish

WYPE is a new Miracle Enamel for autos. It is NOT a wax or polish but a hard, high-lustre ENAMEL finish. With WYPE, anyone can do a beautiful job! Get a quart to paint your car!

SEND NO MONEY!
Order WYPE Today!

8 POPULAR COLORS:

Black	Brewster (dark) Green
Red	Jewel (light) Green
Maroon	Washington (dark) Blue
Gray	Monticello (light) Blue

All $3.95 per Quart

You're SURE You are SAFE When You Paint With WYPE

TESTED by U. S. Testing Co., Inc.

Leading Scientific Testing Laboratory — Report No. 87496, Jan. 5, 1948—and found to conform to the claims and guarantee of the Wype Corporation. U. S. Testing Co. conducts scientific tests for world's foremost organizations and is accepted as the leading authority on such tests. **Wype** is ONE product you can **TRUST** to renew and protect the beauty of your car!

SEE YOUR DEALER or ORDER DIRECT

If your dealer can't supply you, just send us a postcard. We'll ship C.O.D. Just pay mailman for Wype, plus postal charges. Or send remittance with order and WE pay postage.

THESE FINE STORES SELL WYPE

Akron: M. O'Neil Co.; **Baltimore:** May Co.; **Cleveland:** May Co.; **Cincinnati:** Fair Store; **Dallas:** Sanger Bros., Inc.; **Denver:** May Co.; **Ft. Worth:** W. C. Stripling Co.; **Kansas City, Mo.:** Jones Store Co.; **Louisville:** Kaufman-Straus Co.; **Memphis:** B. Lowenstein & Bros.; **Milwaukee:** Ed. Schuster & Co.; **Montgomery:** Montgomery Fair; **New Orleans:** Maison Blanche Co.; **Philadelphia:** Lit Brothers; **St. Louis:** Famous-Barr Co.; **San Antonio:** Joske's of Texas; **Tampa:** Maas Bros.; **Toledo:** Lion Dry Goods Co.; **Youngstown, O.:** Strouss-Hirshberg Co., and many other leading merchants. Phone or visit your favorite today!

WYPE CORP., Dept. 17-C, 2214 Dolman, St. Louis 4, Mo.

6000 SMASH HITS— IN 324 PAGE Wholesale Book

Dealers, agents, salesmen and jobbers, you will find this book bulging with Tested Money Makers. Latest catalog shows average price reductions about 21% on many items. A guarantee of satisfaction stands back of every purchase you make from us. 25c brings you this latest 1948 wholesale catalog of Tested Sellers. You may take credit for the 25c on your first order. In that way the Book will not cost you any money. Get your copy now, before supply is depleted.

SPORS CO. 11-48 Smith St. Le Center, Minn.

Practical Shop Training

in

REFRIGERATION AIR CONDITIONING

and/or

PRACTICAL ELECTRICITY MAJOR APPLIANCES

Service, Maintenance, Installation

Train in the Magic City of the South

Write for Details
COMMERCIAL TRADES INSTITUTE
202 SO. 20TH ST., BIRMINGHAM, ALA.
Veterans Inquire About GI Training

DEVELOP RUGGED STRENGTH!

Strong Men's Club of America offers FREE Membership!

Send for your personal membership card and Strength Secrets. No dues! No obligations! Many valuable privileges! Send name, address, age, on penny postcard.

JOE BONOMO Strong Men's Club of America
Director, (Dept. PS-3A) 1841 Broadway, N. Y. 23, N. Y.

$1.98 For Laughs DAFFY DILLY For Fun The Wonder Drinking Clown

THE GREATEST ACROBAT OF ALL TIME

Complete with stand. No springs, no gadgets, no wires, not mechanical. Sensational "Daffy Dilly" somersaults through the air into a glass of water. It's "eye-stounding." Young and old go wild over him. A wonderful gift. Send no money. Start laughing at the antics of Daffy Dilly today. Pay postman $1.98 plus postage and C.O.D. charges when delivered or send $2.00 and we pay postage.

Special Price to Dealers
BERNARD FINE CO. INC.
501 6th Ave. Dept. PS-10 N. Y. 11, N. Y.

Fit-Rite makes False Teeth TIGHT

Makes loose dental plates fit snugly and comfortably.

LASTS for MONTHS!

Simply squeeze on dental plate and put it in your mouth. Hardens and becomes part of plate. Money-back guarantee.

FREE Generous package of Dental Plate Cleanser with each order. Send $1.00 or mailed parcel post collect.

Fit-Rite Co., 1573 Milwaukee Ave.
Dept. 3-42 Chicago, Ill.

BIG SAVINGS on HAND TOOLS

Reg. $1.75 Miller Falls Screw Pitch Gage, 30 leaf, 89c ● Wood chisels, higrade steel, ½ or ¼" 69c; 1"-89c ● 2" TURNING $1.39 ● Depth Gage, adj. angle, Miller Falls, $1.25 ● $5.00 COMB. GAGE Feeler, Thickness & Taper, precision tool steel, $2.50. Add 10% postage. No C.O.D.'s please. FREE catalogs.

METAL MATERIALS CO.
3923 VAN BUREN PL. PS-3. CULVER CITY, CALIF.

Say You Saw It In Popular Science

WAR SURPLUS! HIGH SPEED DRILL BITS

LIKE NEW! Original value over $16.00. 25 assorted sizes and lengths. **$2.50**

Send check, money order or cash.
Shipped F.O.B. Culver City. Weight 1 Lb.

AIRBORNE SALES CO. INC. DEPT. PSM-3-8 CULVER CITY, CALIF.

Learn BUILDING

AT HOME • All Blue Print Building Plans, Specifications, Lessons Furnished

FIND OUT ABOUT TRAINING AND OPPORTUNITIES FOR YOU IN BUILDING

Established in 1904, Chicago Technical College offers you thorough, practical training in Building, by home-study. Mail coupon for free information. See what this Course has done for others, what it can do for you. Read what Chicago Tech graduates say about their work, earnings, success. Learn the rewards awaiting you as a trained builder—and how quickly, easily you can get started. Simply MAIL COUPON TODAY in an envelope or paste on a penny postcard.

Earn more money as a building tradesman. Prepare for advancement and increased pay as a building foreman, superintendent, inspector, estimator, material buyer or salesman. Train to be a building contractor, have your own money-making business in this busy, prosperous building field.

More than 19 million new homes needed in U.S., say experts. New building now at rate of one million homes a year, plus 200,000 commercial buildings, plus expanding farm building construction.

Mail coupon today. FREE book tells how you learn Building Construction—How to Read Blue Prints, and Estimate Building Costs—at home in your spare time. Learn modern construction methods and materials, how to lay out work and direct all building operations. This is the training needed for rapid advancement to higher-paid jobs, or your own successful building business.

CHICAGO TECHNICAL COLLEGE
C-158 Tech Building, 2000 South Michigan Ave.
Chicago 16, Illinois

MAIL COUPON NOW

CHICAGO TECHNICAL COLLEGE
C-158 Tech Bldg., 2000 So. Michigan Ave.,
Chicago 16, Illinois

Mail me FREE building Lesson with information about big opportunities in BUILDING and how I can train at home.

Name.....Age.....

Address.....

City.....Zone.....State.....

STEP INTO THE AUTOMOTIVE INDUSTRY—A TRAINED MAN!

PRACTICAL SHOP TRAINING
IN
AUTOMOTIVE MECHANICS
BODY and FENDER REBUILDING

If interested write or wire

ATLANTA MOTIVE TRADES INSTITUTE Dept. C, 254 IVY St., N.E. Atlanta, Georgia

Veterans ask about G I Training

PRECISION JEWELERS SCREW DRIVERS
Complete Set of 8 for Every "Hobbyist"

At last—a complete set of precision screw drivers to meet the needs of every model builder. Not a miniature but the same type set used by U. S. Navy for precision instruments and watches during the war. Brass knurled handles, hexagon heads, finest tempered steel blades. Sizes 2-9. Never before a set of this quality and precision at such a low price. Your money back if not satisfied. C.O.D. $2.00 plus postage or send $2.00 and we pay postage.

PINE WATCH CO., Rm. 48, 29 Eldridge St., New York 2, N. Y.

WANT A GOVERNMENT JOB?

START AS HIGH AS $3,021

Many Permanent Appointments Being Made

VETERANS
Get Special Preference

MANY GOVERNMENT JOBS. City and Rural Carriers—Postoffice Clerks—Meat Inspectors—Accountants—Stenographers—Typists—etc. Prepare now for next Examinations.

FRANKLIN INSTITUTE,
Dept. W80, Rochester 4, N. Y.

Sirs: Rush to me, without charge, copy of 32-page book, "How to Get a U. S. Government Job," list of positions, and full particulars telling how to qualify for them.

NAME .....

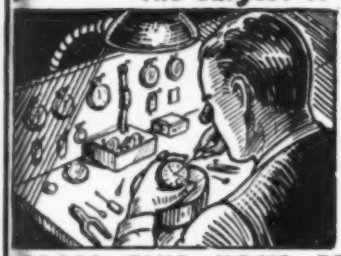
ADDRESS..... *VET?*.....

It's *Child's play* learning to play the
HUNIBEL ACCORDION

No costly lessons, no monotonous scale practicing, no musical knowledge required. You positively can learn to play by yourself and we prove it to you beforehand. Send for free pamphlet which explains this new patent.

HUNIBEL ACCORDIONS
Post Office Box 5408 Chicago, Illinois

Learn
WATCH REPAIRING
from
An Approved School
The Largest of Its Kind



EARN WHILE LEARNING

SPARE TIME HOME TRAINING PREPARES YOU FOR BIG PAY

FREE WATCH working tools and watch included as part of our Watch Repairing Course

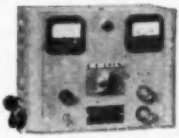
The demand for skilled watch repairers—men and women—is increasing with the step-up in the manufacture of watches. Now is the time to prepare yourself in this fascinating profession with the aid of our highly practical HOME TRAINING COURSE—in your spare time at home. Start your own business or accept a big pay position.

WRITE TODAY FOR FREE DETAILS—Earn while you learn with an "approved" school. Get the facts—then judge.

ILLINOIS SCHOOL OF WATCH REPAIRING
2870-BH Elston Ave. Chicago 18, Illinois

NOW! YOU CAN HAVE YOUR OWN
ELECTRO-PLATING Business
Plate GOLD - SILVER - CHROMIUM, etc.
It's Profitable - Simple - Pleasant

Do as hundreds of successful men are now doing — start your own business! You can plate on metals and non-metals with the **VARI-PLATER.** Your cost is low, profits are BIG! Don't let this money-making opportunity go by!



FREE! Write now for descriptive information and complete price list!

The VARI-PLATER — 110 V., A.C., complete **$55.00**

LEWIS ELECTRICAL MFG. CO. 1266-B Gun Hill Rd. New York 67, N. Y.

MONEY for MEN ALL DATA **FREE**

THE PLASTEX Industry needs manufacturers on small scale and for big production of Lamp and Clock Stands, Art Goods and Novelties in Plastex and Marble imitation. Experience unnecessary. Inc material makes regular 10c store sellers. Rubber moulds furnished for speed production. Small investment brings good returns. Big chain store orders now being placed. Ambitious men have chance for real prosperity. Our Free booklet will interest and benefit you.

PLASTEX INDUSTRIES, Dept. 2, 3400 Third Ave., New York 55, N. Y.

MOTORS

110 v. AC—Heavy Duty CONSTRUCTION
Fractional H.P. ball bearing
New—Ideal for power tools, fans, models, etc.
In Lots of 10—$3.95 ea.
Prices F.O.B., N.Y.C.
Remit 20% Bal. C.O.D.

$4.95 each

MANUEL KLEIN 74P CORTLANDT ST. NEW YORK 7, N. Y.

MAKE THIS **SUIT YOURS** NEW PLAN

EARN CASH SHOWING TO FRIENDS!

Write at once if you want this fine made-to-measure suit! You can get it by taking a few orders from friends, and earn up to $10, $12 in a day. Your bonus suit helps you take more orders with latest style, made-to-measure **guaranteed** suits at amazingly low prices. Also complete line of Ladies' Tailored Suits. No experience, no money needed. Write TODAY for FREE SAMPLES—telling about yourself—age, etc. No obligation!

PIONEER TAILORING CO. Congress and Throop Streets, Dept. C-1121, Chicago 7, Ill.

BIG MONEY FOR YOU!

Just Telling Property Owners About
ZONE HEAVY-DUTY ROOF COATING

Sensational product cuts essential building repair cost up to 75%. Amazing demonstration gets orders in a hurry. Only six average orders a week can pay you well over $190.00!! Complete FREE selling outfit includes everything you need to make big money right from the start. If 30 or over, this may be the opportunity of your life. Tell about yourself. Write, Jack Canning, Vice Pres.

ZONE Company P. O. BOX 789, DEPT. C-13 FORT WORTH 1, TEXAS

RUPTURE SUFFERERS GET RELIEF

Get comfortable, safe relief with scientific support. Soft, sanitary material gives natural support with real comfort to active wearers. Satisfaction guaranteed. For free literature write:

WEB TRUSS CO.
Dept. S-8, Hagerstown, Md.

$200 GROSS IN MY FIRST WEEK!

Some Make More, Some Less . . . Start This Business for YOUR OWN

Would YOU like to own a permanent, year-round business in which it is possible to take in as much as $200 gross the first week, as did L. A. Eagles? R. E. Traynor says, "I made $62 gross in one day." R. R. Newlin reports, "I have averaged $173 gross per week." Others report gross from $100 per week to $12,000 per year.

Surely YOU will want to investigate a golden opportunity like that. You need not have any special skill or experience, but if you are ambitious, honest and courteous, we will help you to start and succeed in YOUR OWN money-making business where net profits are high.

No Shop Necessary

Our Electric Rug Washer cleans rugs and carpets like new right on the customer's floor. This quick, thorough and highly efficient method removes dirt and grime, thus restoring the natural, fresh beauty of floor coverings. Anyone can run it. Rugs and carpets are not harmed.

There are hundreds of possible customers in YOUR vicinity. Most of them have several rugs needing **regular** cleaning. To get a quick start, shampoo a few rugs or carpets. These customers tell their friends and soon you should have an independent, prosperous business, and you should be able to keep it growing. Send the coupon RIGHT NOW for booklet that explains everything.

Every Machine Guaranteed and Easy to Own

You take no risk. These wonderful, fully guaranteed machines have been used and endorsed by largest hotels, railroads—also used by U. S. Government. Many individuals have built up successful businesses that made big profits. Mail the coupon TODAY and we will send complete information, including how to start and succeed in YOUR business **without a large investment.** Don't delay your BIG opportunity. Send the coupon AT ONCE.

FREE BOOK! MAIL COUPON

VON SCHRADER MFG. CO.
A-383, Racine, Wis.

Send at once (no obligation) your FREE booklet containing information about your Electric Rug Washer and how I can own my own permanent, profitable business.

Name_____

Address_____

City_____ (Zone)____ State____

MAIL COUPON TO VON SCHRADER MFG. CO., A-383, RACINE, WIS.

IDEAL — For Lawnmower Sharpening Profits

- PRECISION-BUILT
- GRINDS ALL MAKES OF LAWNMOWERS
- AUTOMATIC OPERATION
- NO EXPERIENCE REQUIRED
- MAKE UP TO $200 PER WEEK
- OPERATE in YOUR OWN GARAGE or BASEMENT

Ideal Lawnmower Sharpener sharpens blades easily, speedily, accurately. Grinds reel knives to fit the straight blade perfectly. Behind Ideal's strong, sturdy construction are nearly 50 years of engineering experience. Handles maximum width lawnmowers. Get ready for the lawnmower sharpening rush now.

Send for FREE Book

The FATE-ROOT-HEATH CO.
Dept. D-4, PLYMOUTH, OHIO

TRAIN for HIGH EARNINGS IN Auto Body and Fender Work

REFRIGERATION and AIR CONDITIONING or DIESEL

Men are needed in these mechanical trades. The pay is good. There are opportunities to grow with the industries and perhaps have own business. Find out now about U. E. I. training that prepares mechanically inclined men for these opportunities.

U. E. I. "Balanced Training" includes preparatory study at home followed by actual practice in our modern shops under experienced instructors. All courses meet high standards gained from 21 years of technical training. *Available to veterans and civilians.* High School diploma not needed. For complete information mail coupon today!

UTILITIES ENGINEERING INSTITUTE
DEPT. 338 CHICAGO 14, ILLINOIS

SEND FOR FREE FACTS

Utilities Engineering Institute, Dept. 338
2525 SHEFFIELD AVE., CHICAGO 14, ILL.
Please send me free facts about U.E.I. training and opportunities in the field checked below:

☐ Diesel ☐ Refrigeration ☐ Welding
☐ Auto Body & Fender Repair ☐ Air Conditioning

NAME_____ Age____

ADDRESS_____

CITY_____ Zone or County____ STATE____

[ ] Check here for special information if you are under 16.

EMPIRE RADIO SCHOOL'S *FREE BOOKLET*

TELLS HOW YOU CAN PREPARE FOR A COMMERCIAL RADIO OPERATOR'S LICENSE

● A profitable career in Radio and Electronics can be yours. Radio—Radar—Frequency Modulation—Television, and Industrial Electronics are rapidly expanding fields where trained men are at a premium. But you must have the training to qualify in this most interesting profession. Before operating transmitters at Commercial Broadcast, Police Communication, Aeronautical, and other stations, you need a Federal Communications Commission License. Our Free Booklet tells you how Empire Radio School's course can prepare you at home to qualify for 1st and 2nd class Radio Operator's Licenses.

SEE WHAT EMPIRE'S RADIO COURSE GIVES YOU

- 60 comprehensive lessons
- 3 Nationally Known Textbooks
- Student Note Book
- Complete 5 Tube Superheterodyne Receiver Kit.
- 20 Periodic Examinations
- Personal Review of your Papers and Suggestions

VETERANS: Empire's Course is approved for G.I. training under Public Laws 16 and 346.

Approved as a Correspondence School under the laws of the State of New York

SEND IN COUPON FOR DETAILS

EMPIRE RADIO SCHOOL, Dept. C
P. O. Box 1170, Rochester, N. Y.

Without obligation, please send me your booklet, free and postpaid.

If you are a Veteran check here ☐

Name.....

Address.....

City.....State.....

Learn A Trade NOW!
PRACTICAL SHOP TRAINING!

In Our Chicago Shops

☐ AUTO MECHANICS ☐ WELDING—ARC and GAS
☐ DIESEL MECHANICS ☐ MACHINIST
☐ REFRIGERATION ☐ PIANO TUNING

One of America's Leading Practical Schools
7 Floors of Fully Equipped Shops
Over 45,000 Graduates
Expert Individual Instruction
Learn by Doing—Low Living Expense
Established 1902—Day and Evening Classes
Above Approved For G. I.'s and Civilians

Also the following Home Study Courses

☐ PLASTIC ☐ BODY AND FENDER
☐ REFRIGERATION ☐ DIESEL
☐ TOOL AND DIE DESIGN

—CALL IN PERSON OR MAIL THIS AD TO—

GREER SHOP TRAINING

(Dept. PS) 460 South State St., Chicago 5, Ill.

Please send without obligation free information regarding trade checked above. (Specify whether you are a Veteran ☐ or Civilian ☐)

Name_____Age_____

Address_____

City_____State_____

INFRA-RED HEAT APPLICATOR

Join the thousands who bless the relieving comfort of this remarkable infra-red heat applicator. Use it for colds, stiff neck, muscular pains, toothaches, facial massage, sinus pains . . . even on feet chilled by poor circulation! Plug into wall socket—AC or DC—and apply curved plastic head to aching spot. Infra-red rays diffuse comforting, warming heat. Safe, easy to use. In unit small enough to carry in handbag when traveling.

$3.45

AGENTS WANTED

SIBERT & CO., 43 Rankin St., Newark 3, N. J.

12 lbs. SURPLUS RADIO PARTS $2.00

A gold mine of parts for repairmen, amateurs, and experimenters . . . sockets, condensers, resistors, transformers, coils, hardware, wire, etc., etc. An outstanding bargain in usable parts! Send $2.00 cash, check or M.O. today!
(Pay small express charges on receipt.)

ELECTRONIC DISTRIBUTORS, Inc. Dept. 83 620 W. Randolph St., Chicago 6, Ill.

INSTALL AND SERVICE OWN OIL BURNER!

SAVE UP TO $150! Send for the famous DELTA PHOTO-INSTALLATION MANUAL. Simple, easy step-by-step photos of a complete oil burner installation. Complete with all necessary plans, drawings and easy-to-follow directions. Published under exclusive copyright at $5.00, **SPECIAL OFFER—CLIP $1 to this ad and mail today!**

". . . am very much pleased with same. . . I am sure it is the most complete manual ever put out by any company...."B.R. Whitehall, N.Y.

DELTA HEATING CORPORATION, Dept. M
85-03 Northern Blvd., Jackson Heights, New York City

Bar Bells

COMPLETE 53 PAGE TRAINING COURSE

● Get fast results with these six scientific body-building courses, 4 barbell and 2 dumbbell courses. Illustrated charts make training easy. Postage prepaid. Send $1.00 today.

$1.00

PARAMOUNT BARBELLS
2440 East 23rd Street, Los Angeles 11, Calif.

EYE-GLASSES *by MAIL*

Send No Money!

16-Day Trial Offer
NEWEST STYLES

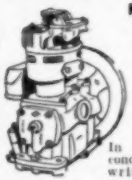
NEW LOW PRICES

FREE Scientific Sight Test Chart and Catalog. Write today.

U.S. EYE-GLASSES CO. 1557 MILWAUKEE AVENUE Dept. 3-42, CHICAGO, ILL.

AIR COMPRESSORS

Model 2-V-S-4-V-A Bendix-Westinghouse 4 cu. ft.



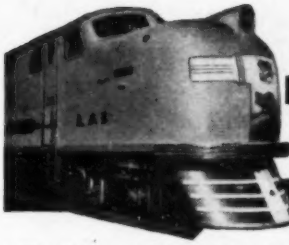
Govt. Surplus, 2 cylinder Bus and Truck Piston Type ball bearing crank shaft. Pressure feed oil system. Positively one of the finest and most accurately built air compressors on the market.

Original Cost Over $140.00

In good operating condition with 30 day written guarantee **$34.50** Special Low "as is" price **$29.50**

Accessories available for compressors, air regulators, safety valves, air gauges, control governor, misc. fittings, hose, paint guns. Write for Prices and Catalogue.

MIDWEST SURPLUS SALES CO. 1520 Locust St. Kansas City, Mo.



GET INTO DIESEL NOW!

Let this Great School qualify You!

LEARN AT HOME IN YOUR SPARE TIME

• With National Schools' tested and proved Master Shop Method of Home Training, you can become a qualified Diesel and Automotive technician equipped to step right into a good paying job. One of America's great trade schools, established in 1905, stands behind your training!

National Schools-trained Diesel and Automotive Technicians Are Welcome Everywhere

Our files are filled with facts of National Schools-trained men who have reached success in their chosen field because of the thorough, practical and up-to-date instruction we gave them.

Diesel is becoming more and more important in transportation, industry and agriculture all over the world. Trained men who really know Carburetion, Ignition, Fuel-Injection, Motor Tune-up, etc., are in constant demand to fill interesting, good pay jobs. Opportunity is here **now** for you.

Every Word and Picture in Your Home Study Course Comes out of the Great National Schools Training Shops

Behind all National Schools training is our permanent faculty of experienced instructors and engineers who will teach you about Diesel-electric, Internal Combustion Engines, including Diesel, Gasoline and Butane Types, High-octane fuels, Automotive Drive Systems, etc. National Schools instructors are daily teaching resident students in our modern, fully equipped Shops and Classrooms, using the same instruction methods and lessons you study at home in your spare time. These instructors **know how** to guide your home study!

TODAY'S GREAT OPPORTUNITIES IN DIESEL, AUTOMOTIVE AND ALLIED MECHANICS

Get These FREE BOOKS

It will cost you nothing to learn how you can grasp opportunity in the great Diesel industry. Send the coupon below for a sample lesson from National School's Home Study Course, and your big Opportunity Book giving further information.

G. I. APPROVED NATIONAL SCHOOLS

LOS ANGELES 37, CALIFORNIA EST. 1905

MAIL OPPORTUNITY COUPON FOR QUICK ACTION

National Schools, Dept. PSD-3 (Mail in envelope or paste on penny postcard)
4000 South Figueroa Street
Los Angeles 37, California

Mail me FREE the book, **YOUR FUTURE IN DIESEL**, together with the Sample Lesson. I understand I may keep and use the information with no obligation.

Name..... Age.....
Address.....
City..... Zone.... State.....
.... Check here if Veteran of World War II

Now for EVERY WORK SHOP!

"NEW Invention" **Electroplates by BRUSH**

Easy to Plate CHROMIUM
GOLD, SILVER, NICKEL, COPPER
. . . For Pleasure and Profit!

If you have a workshop—at home or in business—you need this new Warner Electroplater. At the stroke of an electrified brush, you can electroplate models and projects—you can replate worn articles, faucets, tools, fixtures, silverware, etc. with a durable, sparkling coat of metal . . . Gold, Silver, Chromium, Nickel, Copper or Cadmium. Method is easy, simple, quick. Everything furnished—equipment complete, ready for use. *By doing a bit of work for others, your machine can pay for itself within a week.* So make your shop complete by getting a Warner Electroplater right away. Send today for FREE SAMPLE and illustrated literature. ACT AT ONCE! *Mail Coupon.*

WARNER ELECTRIC CO., DEPT. R-31
1512 Jarvis Avenue, Chicago 26, Ill.

FREE *Details & Sample!*

WARNER ELECTRIC CO., 1512 Jarvis Avenue, Chicago 26, Dept. R-31
Gentlemen: Send Free Sample and Details to:
*Name*_____
*Address*_____
City *State*

Keep that Car "TICKING"

7 DAYS FREE TRIAL

1588 PAGES
1500 ILLUSTRATIONS

Every operator and mechanic needs AUDELS AUTO GUIDE.

This book saves time, money and worry. Highly endorsed. It presents the whole subject of auto mechanics:

1—Basic principles
2—Construction
3—Operation
4—Service
5—Repair

Handy Size. Easily understood.

NEW FLUID DRIVE, HYDRAULIC SHIFT AND DIESEL ENGINES FULLY COVERED

Over 1500 pages—1540 illustrations showing inside views of modern cars, trucks and buses with instructions for all service jobs.

ASK TO SEE IT!—To Get This Assistance for Yourself Simply Fill in and Mail Coupon Today.

$4 COMPLETE • PAY ONLY $1. A MONTH ←

AUDEL, Publishers, 49 West 23rd St., New York
MAIL AUDELS NEW AUTO GUIDE for free examination. If O.K. I will send you $1 in 7 days; then remit $1 monthly until price of $4 is paid. Otherwise I will return it.

Name_____
Address_____
Occupation_____
Employed by_____ P.S.M.

NEW—*Army Surplus*

ELECTRIC MOTORS

24 Volt... AC-DC., Ball Bearing

1/6th H.P. 6350 R.P.M.

1/10th H.P. 3600 R.P.M.

1/11th H.P. 3600 R.P.M.

1/12th H.P. 6000 R.P.M.

1/20th H.P. 3900 R.P.M.

3 1/2 H.P. 24V. D.C. ONLY

ORDER TODAY YOUR CHOICE $2.95 EACH

All prices F.O.B. Detroit. Send cash or money order. No C.O.D.'s—Orders shipped by railway express.

RADIO CENTER
2530 E. DAVISON
DETROIT 12, MICH.

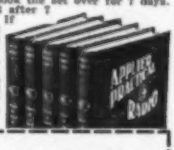
RADIOMEN! ELECTRICIANS!

Get this Valuable Book FREE for Merely Examining Coyne's NEW Pay-Raising 5 VOLUME SET APPLIED PRACTICAL RADIO

EXPLAINS LATEST SETS

Here's real news for every man interested in Radio. A sensational new PRACTICAL set of radio books just off the press! Gives you the "know how" on everything in Radio today. Basic principles to the newest in Television and F.M.—how to construct, install, service. Latest trouble-shooting methods. 1000 illustrations, over 1500 pages. To prove how valuable these great books can be to you, Coyne will give you a *FREE* copy of our new, helpful guide, "150 New Radio Diagrams Explained" *just for looking over the 5 Volume Set.* Applied Practical Radio is ideal for reference or home training. Coyne's 48 years of shop experience is behind it to help you to *bigger pay, better jobs, greater opportunities in Radio.* OFFER LIMITED—ACT NOW! Here's our offer to you—if you act promptly. We will send you the 5 volume set APPLIED PRACTICAL RADIO for 7 days FREE examination, together with the Radio Diagrams. Look the set over for 7 days. If you like it send either $15 cash, or $2 after 7 days and $3 monthly until $16.75 is paid. If you don't want the set, return it and you owe NOTHING. Either way you keep the *Radio Diagrams Book absolutely FREE.* SEND NO MONEY! Coupon below just asks to see the books free and get your gift book for doing it! Send coupon TODAY!

FREE BOOK COUPON



Educational Book Publishing Division
COYNE ELECTRICAL & RADIO SCHOOL, Dept. 38-R7
500 South Paulina St., Chicago 12, Illinois

OK. Send me, postpaid, Coyne's new 5 volume set, "APPLIED PRACTICAL RADIO" for 7 Days FREE TRIAL per your offer. Also send, absolutely FREE, "150 New Radio Diagrams Explained" as a gift.

NAME
ADDRESS
TOWN ZONE STATE

FREE BOOK

SCREEN PROCESS PRINTING
LEARN AND EARN AT HOME!

WITHOUT PREVIOUS ART EXPERIENCE

3 WAY Home Study Course Shows How To

1. START YOUR OWN PROFITABLE BUSINESS. 2. GET A GOOD PAY JOB. 3. EARN EXTRA MONEY IN SPARE TIME.

1. LEARN BY DOING
2. ANYONE CAN LEARN
3. UNCROWDED FIELD
4. NO MACHINERY
5. IN GREAT DEMAND
6. A BUSINESS OF YOUR OWN

2 BIG KITS are yours at no additional cost. Complete in every detail. Every item needed to complete the course included.

WRITE FOR FREE BOOK NOW!

CALIFORNIA SCHOOL OF SCREEN PROCESS
3700 OVERLAND BLVD., DEPT. S-38, LOS ANGELES 34, CALIF.

VETS: APPROVED UNDER G. I. BILL

Learn LANDSCAPE GARDENING

A thorough, interesting constructive home training, covering your regional conditions, for those who wish to become LANDSCAPERS, DESIGNERS, GARDENERS, etc., for profit or pleasure. Write today for FREE INFORMATION without obligation.
Approved for Veterans—in all States
NATIONAL LANDSCAPE INSTITUTE
Dept. PS-3, 310 So. Robertson, Los Angeles 36, Cal.

DUAL TAIL PIPE EXTENSION

Fits all cars—chrome plated
DEEP TONE
produced by 2 1/2 inch outlets
Postage free on prepaid orders
DEALER INQUIRIES INVITED
$2.95
LYONS PRODUCTS COMPANY
Pat. Pend. 2319 Ridgeley Drive, Dept. PS3, Los Angeles 16, Calif.

Learn BAKING At Home

Baking is one of America's high industries in wages. Nearly depression-proof. Thorough basic home course lays sound foundation. If you have aptitude, write for FREE BOOKLET, "Opportunities in Commercial Baking."
National Baking School, 1315 Mich. Ave., Dept. 1383, Chicago 5

Become a Doctor of PSYCHOLOGY

Win the degree of Ps.D. Teach the secret of contentment, happiness. Solve mental worries. Experience the revelation of truth. Chartered college. Individual help. Write for FREE book. COLLEGE OF UNIVERSAL TRUTH, 5153-A North Clark St., Chicago.

Say You Saw
It In Popular Science

If Ruptured

Do What Others Now Do—
Wear a Form Fitting MILLER Truss
which provides natural freedom and comfort in working, walking, playing, horse back riding, dancing, swimming or sleeping. You just cannot afford to be without this protection and convenience.
Wear two weeks then consult your physician before deciding to keep it.
Write me today for **FREE** descriptive circular. Sent in plain, sealed envelope.

FRED B. MILLER Manufacturer
Dept. P.S. Hagerstown, Maryland.

Every Driver Needs . . .

Pat. Pend.

only **$4.95** postpaid complete

HANDE-FEED
Finger-Tip Gas Control

DRIVE RELAXED! . . . Install HANDE-FEED on your car and MINIMIZE DRIVING FATIGUE! Installed in about 15 minutes on most cars. Connects directly to carburetor. RELIEVES AND RELAXES THE FOOT. Minimizes back-roll on up-hill starts. Simply lift lever to increase engine speed, when released engine idles. Pivots for use with right or left hand. Does not interfere with gear shift or steering. Chrome finish. Complete instructions with every unit. $4.95 postpaid. Send check or money order.

TRANS-CONTINENTAL IND., Dept. PS-2, 318 Olive, St. Louis 1, Mo.

CURIOUS?

ABOUT A
SHIP-IN-A-BOTTLE
HERE IS THE SECRET

PLUS all of the material for only 75c postpaid, less bottle.—For other unusual and beautiful projects send 10c for the new, fully illustrated catalog.

75c Postpaid in U.S.A.

Braun-Craft 1232 ETOWAH, DEPT. PS3 ROYAL OAK, MICHIGAN

EARN EXTRA MONEY

MAKE YOUR OWN
LEATHER
BELTS-BILLFOLDS

LEATHER CRAFT . . . Learn this easy and simple way to make money. Make all kinds of hand-tooled leather goods. Hinckley-Tandy has everything for Leather Craft . . . Modelling Tools, Leather, etc. Write today!

Send For FREE CATALOG Dept. P. S.

HINCKLEY-TANDY LEATHER COMPANY
P. O. BOX 791 • FORT WORTH 1, TEXAS

ANALYZE *Handwriting*

Uncrowded, fascinating field. Gratifying earnings reported by graduates in Employment, Credit, Social Service, Police and Entertainment fields. Others have developed profitable private practice, full or spare time, as Personal Problem and Vocational Counselors. Send for 3000 word TEST LESSON and Grapho Analyst FREE.

A. I. G. A. Inc., Wilhelt Bldg., Dept. 126, Springfield, Mo.

V-8 DUALS & SINGLES

MUFFLERS
STEELS and ALUMINUMS with a motorboat tone

SINGLES, Chev., V-8, Plymouth, Steels $5.50, Aluminum $7.00. Chry., Olds., Buicks, etc., Steels $7.50, Aluminum $9.00. V-8 and MERCURY DUALS, Steel $17.50, Aluminum $21.00. Split Manifold Sets, Steels $35.00, Aluminum $45.00. Aluminums are guaranteed for life of your car.

DEALERS WANTED

SANDEE MUFFLER CO.
BOX 296 LA 7JJ LOS ANGELES 43 CALIF
2624 W. SLAUSON AVE. LOS ANGELES CALIF

FREE *get it now*

ALLIED'S NEW 1948 RADIO CATALOG!

172 Value-Packed Pages

EVERYTHING IN RADIO AT LOWEST PRICES

TELEVISION AND NEW HOME RADIOS

SERVICE SUPPLIES
BUILDERS' SUPPLIES

AMATEUR GEAR

SOUND SYSTEMS

Radio's Great Buying Guide

Send today for your FREE copy of Radio's Leading Catalog! It's the preferred Buying Guide for Servicemen, Dealers, Engineers, Soundmen, Amateurs, Builders and Experimenters. Shows everything you want in Radio and Electronic equipment—all the newest releases—complete, highest quality stocks at low, low prices that save you money on every purchase!

World's Largest Stocks!

You'll find *everything* in the new 172-page ALLIED Catalog—television receivers, latest home radios and radio-phonos, Ham receivers and station equipment, test instruments, public address equipment, new builders' kits, thousands of parts, tubes, tools, radio books, diagrams. Get the speedy, reliable service and expert help you want from ALLIED—Radio's Largest Supply House! Be sure to send today for your FREE copy of ALLIED'S new 1948 Buying Guide!

ALLIED RADIO

ALLIED RADIO CORP.
833 W. Jackson Blvd., Dept. 7-C-8
Chicago 7, Illinois

FREE CATALOG

☐ Rush FREE 1948 ALLIED Catalog

Name.....

Address.....

City.....Zone.....State.....

MAKE BIG MONEY IN LIQUID SYNTHETIC MARBLE

FEW DOLLARS STARTS YOUR OWN PROFITABLE BUSINESS!

Here are 3 amazing, new opportunities to get into your own highly-profitable, dignified business—without previous experience—regardless of your age or sex. **1. LIQUID Synthetic MARBLE**—Easy to make and install beautiful synthetic Marble Slabs—pouring from liquid state. Big Demand for kitchen and bathroom walls, etc. **2. FIBRE-VITE FLOORING**—Easy to make and install—in any color or color combination. Many years wear. Dustproof. Soundproof. Verminproof. **3. FLEXIBLE MOLDS**—for Plaster Casting. $1.00 in raw materials makes up to $25 worth finished products. F. B., Iowa, writes: "Am on job that will net me $150 for 4 days work." Get FREE details. No obligation. Write today!

Write for FREE DETAILS NOW!

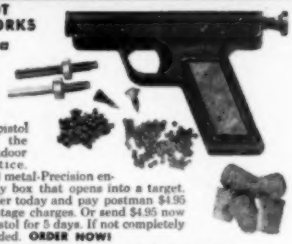
COMPOSITION PRODUCTS CO.
5853 Delmar Blvd. Dept. 32 St. Louis 12, Mo.

4 in 1 AIR PISTOL
POWERFUL • ACCURATE

SHOOTS BB SHOT
DARTS • PELLETS • CORKS

Looks, Feels like a Luger Automatic

COMPLETE WITH 2 BARRELS & 127 PIECES AMMUNITION



Here's the high powered air pistol you've been looking for the Sportsman, Jr. Swell for Indoor or Outdoor Target Practice. Highly accurate to 20 ft. All metal-Precision engineered. Packed in display box that opens into a target. SEND NO MONEY! Order today and pay postman $4.95 plus small C.O.D. and postage charges. Or send $4.95 now and we pay postage. Try Pistol for 5 days. If not completely satisfied, your money refunded. ORDER NOW!

SIDNEY SMITH INTERNATIONAL
1112 Wilshire, Dept. B-3 Los Angeles 14, Calif.

TX-5 GEIGER COUNTER
for Locating RADIOACTIVE MINERALS

The TX-5 is light weight, battery operated. Locates deposits of radioactives. Simply switch "on"—clicks in headphones indicate presence of radioactives. Extra sensitive, yet ruggedly built.

Each unit comes complete with headphones, probe, batteries and manual. For prospecting and mining operations. Write for details and price. Address Dept. 2

Geiger Counters for every purpose...
- OIL PROSPECTING
- MINERAL LOCATION
- HOSPITAL WORK
- INDUSTRIAL USE

OMAHA SCIENTIFIC SUPPLY CORP., 3623 LAKE, OMAHA 4, NEBR.

$200.00 NAVIGATOR'S SEXTANT $17.50

GOV'T. SURPLUS

A precision instrument of recognized quality. These Link Sextants are used for navigating by the stars or other celestial bodies, on large and small boats—for all types of aircraft—anywhere on the face of the earth. The Sextant is to the mariner what the transit is to the surveyor.

FINEST PRECISION CONSTRUCTION

These fine Link Sextants are the product of a famous name manufacturer. Original procurement cost was approximately $200.00. Now, as war surplus, you can buy one at a fraction of original cost. Instrument is equipped with easy-reading vernier type scale. Bubbles are checked for accuracy. Although slightly used, they are in perfect operating condition. Furnished complete with operating instructions and protective wood carrying case 8x12x4 inches. These are guaranteed to be the genuine Link A12 Sextants. Sold FOB Houston. Send check or money order. Rush your order.

$17.50

AERO PARTS SUPPLY, Dept. PS3
Municipal Airport HOUSTON 12, TEXAS

FENCING
World's Finest Sport Exciting Fun—Harmless

Just Out! Two 3 ft. Spring Steel Foils with Safety Rubber Buttons. Complete Outfit 2 foils (swords) with hand guards and Free Instruction Book Now Only $1.98 Postpaid. A healthful & clean sport, makes you Strong & Alert. Instruction Book teaches Quickly-Easily. Mail check or Money Order for $1.98 Today. Add 28c for Foreign postage.

LEE PRODUCTS CO., 1613-K First Ave., New York 28, N. Y.

AIR RIFLES BENJAMIN AIR PISTOLS
PIONEERS - LEADERS

SEND FOR FREE FOLDER OF LATEST MODELS TODAY

If you want a REAL GUN for PRACTICAL USE inside or outdoors get a SAFE - CLEAN - ECONOMICAL - BENJAMIN with Adjustable Power and Amazing Accuracy. For BEST RESULTS use BENJAMIN H-C PELLETS. WRITE AT ONCE. BENJAMIN AIR RIFLE CO., 811 MARION ST., ST. LOUIS 4, MO.

RUPTURE!

An amazing Air-Cushion Invention allows body freedom at work or play. Light, neat, cool, sanitary. Durable, cheap. Day and night protection helps Nature support weakened muscles gently but surely. No risk. **Sent on Trial!** Write NOW for free Booklet and **Proof of Results.** All correspondence confidential.

Brooks Company, 163-A State St., Marshall, Mich.

BRAND NEW Solid Brass 7 Ft. Portable

RADIO ANTENNAS

Real $12 Value Now Only $3.45 Postpaid
FOR HOMES, BOATS or AUTOS

Just Out! Gov't surplus used on Army tanks. These telescopic rustproof antenna have tremendous pickup eliminate dangerous wiring. Solid Brass throughout practically insuring NOISE FREE RECEPTION.

7 Exceptionally Rugged Sections compress into 1 ft. 3 in. Handy for Camping Trips, also Useful for Transmitting FM & Television sets. *Each antenna comes securely packed with mounting bracket. Easy to install anywhere.*

QUANTITY LIMITED
ORDER TODAY. A real $12 value for only $3.45 Postpaid. Mail check or money order now or sent C.O.D. plus postage. Money back in 10 days if not satisfied.

RADIO HOSPITAL 422 East 86th St., Dept. B15 NEW YORK 28, N. Y.

RACE 'EM FOR FUN

GENUINE PHOTOGRAPHS TAKEN AT THE TRACKS

20 REAL RACES IN EACH PACK!

Be FIRST with this racy, racetrack novelty! Pack contains 20 actual Photos of real races—but here's the trick: They're PLAIN until you use the magic paper included. INSTANTLY, a winning horse appears! Place bets on back of cards. You'll GO for these!! Only $1 prepaid—3 Packs, $2.50. (Write for wholesale prices).

STAR SPECIALTY CO.
DEPT. PS-1 BUTLER, PENNA.

STOP CHANGING MOTOR OIL!

End this needless waste and expense forever with

RECLAIMO Today's Most Advanced Oil RE-REFINING Filter

Continuously cleans and **RE-REFINES** motor oil as you drive (by utilizing motor heat)—keeps oil in high grade lubricating quality at all times—reduces motor wear to a minimum! Proves conclusively that **"Oil Does Not Wear Out Mechanically"** as stated by **U. S. Bureau of Standards. (Bulletin 86).**

"RECLAIMO"

- **REMOVES SOLIDS (by filtration)**
- **REMOVES WATER (by distillation)**
- **PREVENTS Excess Fuel Dilution**
- **PREVENTS Acid and Sludge Formation**

MAINTAINS Stable Viscosity **ELIMINATES** All Oil Changes

CAR • TRUCK • TRACTOR OWNERS!

NEW ADDED FEATURE! Gas-Moisture Vapor Injector Increases Mileage with Smoother Performance

You'll want to know more about Reclaimo's Oil, Motor and Money-Saving Features. **FREE 40-PAGE BOOK "OIL FACTS"** gives you the complete "Reclaimo" story plus details about our **New 90-Day No Risk-No Cost TRIAL OFFER!** WRITE for YOUR COPY TODAY!

RECLAIMO MFG. CO.

5083 ELSTON AVE., Dept. 67, CHICAGO 30, ILL.

• LEARN LEATHER CARVING •

Home study course prepares you for this interesting and profitable hobby. Many students earning as much as $3.00 an hour in spare time carving billfolds, belts, handbags, saddles, etc. Complete with instructions, designs and individual analysis of your work. **Send for catalog.**

BAIRD'S SCHOOL OF LEATHER CARVING, 1212-B South Bonnie Brae, Los Angeles 6, Calif.

FLOYD CLYMER'S unbiased book "INDEPENDENT TEST REPORT ON KAISER-FRAZER CARS"

Read what 3000 owners now think of their K-F cars. Expert, part-by-part analysis. 100 photos. Tells all. 3000-mile test run, Pike's Peak closed car record, gas mileage. Thousands are buying. Order now. $1.50 postpaid. $2.50 deluxe ed. Cash, money-order, or specify C. O. D. Money-back guarantee. Clymer, Publisher, Dept. PS-3 2125 W. Pico, Los Angeles 6, Calif.

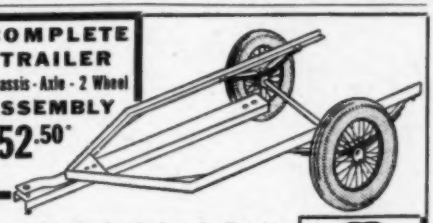
FIELD JACKETS

A Super-value, fine poplin Army FIELD JACKET can be yours for only $2.88. Quality features: full zipper-front, 100% blanket-lined, water repellent, adjustable hip straps. Ideal for Farmers, Lumbermen, Truck Drivers, Sportsmen. Although used, every jacket guaranteed good condition. Sizes 34 to 40. State size and send check or M.O. Supply limited. Hurry.

(War Surplus) ONLY **$2.88** Postpaid

MARKO SURPLUS CO., Dept. PS-3, 2924 Logan Blvd., Chicago 47, Ill.

COMPLETE TRAILER Chassis - Axle - 2 Wheel ASSEMBLY $52.50*



Never before offered at this low price. Tested to carry 1000 lbs.—built to take hardest usage... **COMPARE!**—in construction—utility—value! You'll agree there's nothing like it.

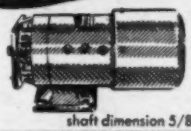
YOU GET: Complete draw bar assembly, chassis of steel angle, 2 automobile type springs; 2 wheels with Timken roller bearings take standard 4.75 x 19 tires, 2 hub caps and grease rings . . . 91" Overall, 57" Tread. Less Tires, Tubes.

*Shipped KD., F.O.B. Yonkers or send $10 & balance C.O.D.

Complete wheel & hub assembly $9.00 Ea.

UNIVERSAL YONKERS CORP. 137 Alexander St., Yonkers 2, N. Y.

WAR SURPLUS AND OTHER BARGAINS

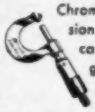


EMERSON 3 HP MOTOR: AAF Type D50. This motor can also be used as generator when driven by another motor. Ideal for portable welder, etc. 28 Volts, D.C. Compound, 3800 RPM, 115 AMP, windings glass insulated, blower cooled, shaft dimension 5/8". Weight 27 Lbs. new **$13.95 each**

SEND CHECK, MONEY ORDER or CASH

SPOTLIGHT: Made for Air Corps, trigger switch for signalling, second switch for continuous light, 12 Volts, throws a powerful beam, seal beam reflector. For use on farms, around homes, trucks, autos, boats, police cars, fire trucks, etc., complete with 15 ft. rubber-covered 2-wire cable. Weight 6 Lbs. **$7.95** Each. Extra seal beam reflector, **$1.** Each.

SCOOP! We have been awarded 100,000 genuine briar pipes by Quartermaster Corps. Assorted shapes and sizes. All popular makes Set of 6, **$3.50**



MICROMETER: Chrome plated, precision engineered and carefully tooled to give long life and highest degree of accuracy... all new. 1" capacity, **$2.25** 2" capacity, **$3.50** Each.

25% DEPOSIT REQUIRED ON C.O.D. ORDERS

TRANSFORMER: Jefferson Electric step up or step down transformer. Input, primary 110-117 Volts A.C. Output, from 5 Volts to 650 Volts. Suitable for use with war surplus gadgets, heater relays, radio test filaments, electric trains, house chimes, etc. Weight 10 Lbs. New. **$7.95** Each.

GOGGLES: Designed for paratroopers Unbreakable, laminated, cellulose acetate lenses. Adjustable elastic band. Great for motorcycling, speed boating, skiing, hot-rod driving, etc. All new.. 2 pair for **$1.00.** (One polarized and one clear.)

"WRAPLOCK" KITS: Make your own clamps to fit any size hose, tubing etc. Kit contains ratchet to take up slack, enough steel band and yokes for 100 or more jobs. New. Weight 4 Lbs. **$2.** Each complete.

ALL PRICES F.O.B. CULVER CITY, CALIF.

CLAMPS: Rubber lined, aluminum, hundreds of uses in any shop. Assorted sizes, all new. 5 Doz. **$1.** — 500 **$5.00**

BLOWER COOLER or HEATER: For trailers, autos, offices, darkrooms, homes. DUMORE Motor, 1/6 cont. HP, Amperage 7.5, RPM 6400, 24 Volts. May also be used as dryer. Simple installation, radiator type, copper coils. Transformer advertised in this ad will operate this unit from house current. Weight 13 Lbs. New, **$15.00**

CONDUIT WRENCH: Mfd. by JOAR. Jaws pass over conduit, pipe or tubing, slips down to snugly encircle fittings. Slight pressure tightens or loosens fittings. Will not mar or kink material. Set of 8. All new wrenches, Nos. 4-6-7-8-10-14-22-28, (Reg. cost $50.00), **$10.00** per set. Weight 4 Lbs.

AIRBORNE SALES CO., INC. DEPT PSM 3-8 CULVER CITY, CALIF.

LEARN LANDSCAPING

Profitable, healthful career—absorbing hobby, for men, women. Thorough 45-lesson home-study course takes 8-12 months spare time. Hundreds of successful graduates all over the world, 32nd year. Send for FREE catalog.

American Landscape School, 6477 Grand Ave., Des Moines, Iowa

Play a Saw

Quickly produce saw music of amazing, voice-like beauty. Without knowing one note from another, without using music, soon play such songs as "Long, Long Trail," "Till we Meet Again," and other favorites old and new. No notes to read, no dreary practice—success guaranteed.

Since 1921, thousands of our students have amazed themselves and friends...many have starred in shows and broadcasting orchestras. This is your opportunity to gain quick popularity, and to make money entertaining at parties, dances, lodges, clubs, church entertainments, everywhere.

You Play or NO PAY!

5 DAYS TRIAL

If you can sing, whistle or hum a tune then you can play the Musical Saw. To prove how quickly and easily you can learn, we allow you FIVE DAYS TRIAL. *Play at the next party! Write TODAY for details to . . .*

MUSSEHL & WESTPHAL

Novelty Musical Instruments—Est. 1921
33 Fort Street
Fort Atkinson, Wis.

GI TRUCKS AND JEEP PARTS

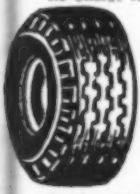
Military Type. We have for immediate delivery genuine parts for all makes and models, 4x2—4x4—6x4 and 6x6. All models from ¼ ton to 20 ton. All Makes: Jeeps, Fords, Chevrolet, GMC, Studebaker, Reo, Auto Car, Federal, Diamond T, Brockway, Bierderman, Mack, Oshkosh, Dodge, White and Sterling.

Special Discounts to Fleet Owners On Above Parts

COMPLETE ENGINE ASSEMBLY WHITE MODEL 160 AX

Removed From U. S. Army Halftracks—This is a 6 cylinder 387 cu. inch engine that can be used in many trucks and tractors or can be used as a stationary engine. Engines are complete with all carburetion and 12 volt electrical system accessories: generator, starter, distributor, coil, voltage regulator, fuel pump, carburetor, water pump, fan and clutch. Engines have been slightly used but are in excellent serviceable condition. Ready to install and run, each $388.00. In lots of six, each..... **$350.00**

No Charge for Crating.



TIRES

NEW Standard Brands U. S. & others 8.25 x 15—14 Ply, each..... **$39.50**

USED 7.50 x 20—8 ply. Military & Std. Treads. No repairs. 50 to 70% tread, each $15.00. Lots of 4 each **$12.50**

All prices quoted are FOB, Kansas City, Mo. and are subject to prior sale. 25% deposit on COD orders.

UNITED AUTO PARTS CO., Inc.
1901 Troost Phone GR 1800 Kansas City, Mo.

$7.50 postpaid or C.O.D. charges added. Free literature on request. Money back guarantee. Inquiries from dealers, jobbers and representatives invited.

OMICRON BEAM COMPASS SET

For the Draftsman and Craftsman in Metal and Wood

6-foot radius capacity within a few inches of space. Equipped with lead-holder and steel scriber. The steel blade on edge assures rigidity and accuracy. Instant setting of radius on graduations. Automatic lever locks blade tight. Only when lever is depressed can blade be moved. This is a precision instrument, made of the best of materials, packed in sturdy attractive wooden case. **THE OMICRON CO., Dept. 21, Box 907, Glendale, Calif.**

Free Book

RAISE HAMSTERS

● The new wonder animals from Syria. Often called Toy Bears. Delightful pets. Everyone wants them. Laboratories need thousands. Clean, odorless. Raise anywhere. A profitable and interesting hobby or business. We furnish breeding stock with manual of instructions.

Write today for free illustrated literature.

GULF HAMSTERY 1540 BASIL, MOBILE, ALA.

LEARN TO PLAY AN
ACCORDION
"THE PAGANI WAY"
WRITE FOR DESCRIPTIVE CIRCULAR
O. PAGANI & BRO., INC. 289 Bleecker Street New York 14, N. Y. Dept. S

★ WRIST WATCH
★ STOP WATCH
★ TELEMETER
★ TACHOMETER

Phenomenal Value!

17 JEWEL • 2 PUSH BUTTON

CHRONOGRAPH

ONLY **$29.75** PLUS 10% TAX

INCABLOC SHOCK RESISTANT FEATURE
• Sweep Second Hand • Radium Dial • Anti-Magnetic • Unbreakable Crystal. (formerly $71.50)

IDEAL FOR
• Physicians • Engineers • Radio Men • Sportsmen • Photographers • Aviators

OUR GUARANTEE
MONEY BACK IN 10 DAYS
If not satisfied for any reason
Watch enlarged to show detail

Also available in 18-k Gold Case. $64.50 (plus 10% tax), formerly $125.

ADLEW JEWELERS Dept. PS-3
117 W. 42nd St., N. Y. C. 18
Mail Orders Promptly Filled • Shipped C.O.D. or send check or money order.

Famous Imported SWISS

WATCHES

for only **$6.49**

Radium Dial
Sweep Second Hand

Light or black face. Sturdy construction, richly chrome-plated case, handsome leather band. Absolutely not a toy, these are precision-made men's wrist watches. Have the appearance and time-keeping ability of watches costing 2 and 3 times as much. AN IDEAL GIFT! Carefully tested and sold with a 10-day Money Back Guarantee. SEND NO MONEY! Simply pay postman $6.49 plus 10% federal tax and postage on delivery. CASH ORDERS SENT POSTPAID! Ohio orders—add 3% sales tax. Send now—supply limited!

EURAMA CO., 425 Citizens Bldg. - Dept. 2MB - Cleveland, Ohio

HERE'S A 5 TUBE *RADIO KIT*

for only *$9.95* complete with tubes

CABINET *Free!*

• YOU GET EVERYTHING

Yes—EVERYTHING YOU NEED for the complete successful assembly of this excellent radio.

Simple to Assemble!

There are no complicated or confusing instructions to follow. Everything has been so simplified that you can build this 5 tube kit from only one simple diagram. Positively no previous experience in radio is required. Yes, this is the kit you've always wanted!

Imagine all these extra features:

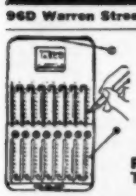
- *5 Tube Super-heterodyne
- *PM Speaker
- *Built-'n Antenna
- *AC DC Current
- *Automatic Volume Control
- *Tuning from 520 KC to 1590 KC
- *Can be Aligned Without Servicing Instruments

(Price does not include solder and wire)

DON'T DELAY —TAKE ADVANTAGE OF THIS EXCEPTIONAL VALUE NOW!

SENCO RADIO, INC. 25% Deposit on All Orders, Balance C.O.D., F.O.B. New York

96D Warren Street, New York 7, N.Y., Beekman 3-6498



POCKET ADDING MACHINE

Amazing palm-size adding machine does all figuring. Adds, Subtracts. Aids in Multiplication & Division up to $99,999.-999. All steel, guaranteed 5 years, fits pocket. Millions in use all over the world.

Free Trial $2.50 We pay postage on prepaid orders or COD plus postage & charges. Money back if not satisfied. Leatherette case 25c additional.

TAVELLA SALES CO., Dp. 273, 25 W. Broadway, New York 7, N. Y.

MAKE MONEY—WITH CHIN-CHINS

No experience needed. Start with pure-bred CHIN-CHIN Chinchilla rabbits—a few females and a male—you'll soon have at small cost, a large, profitable herd. FREE INSTRUCTIONS. BIG DEMAND for breeding and laboratory stock, meat, and world's most beautiful rabbit fur. DEALERS, CUT OFF FROM IMPORTED RABBIT PELTS BY WORLD FAMINE, NEED CHIN-CHIN FURS NOW AND FOR YEARS TO COME! Write today for free, illustrated catalog.

WILLOW BROOK FARM • R-11A SELLERSVILLE, PA.

KINKADE GARDEN TRACTOR

and Power Lawnmower

A Practical Power Plow and Cultivator for Gardeners, Suburbanites, Florists, Truckers, Nurserymen, Fruit Growers.

Easy Terms - Write Today

American Farm Machine Co.

1072 33rd Ave. S. E. Minneapolis, Minn.

Catalog Free

TRAIN NOW FOR AN

AVIATION CAREER

IN SUNNY SOUTHERN CALIFORNIA

MAXIMUM TRAINING IN MINIMUM TIME

Specializing in AERONAUTICAL ENGINEERING and MASTER AVIATION MECHANICS since 1929 ... America's Finest Aeronautical Institute ... 7000 successful graduates ... MAKE MORE MONEY ... MAIL COUPON TODAY. APPROVED FOR VETERANS. Board and Room now available.

Without obligation, send free catalogue with full information.

NAME _____ AGE _____ PS-3

ADDRESS _____

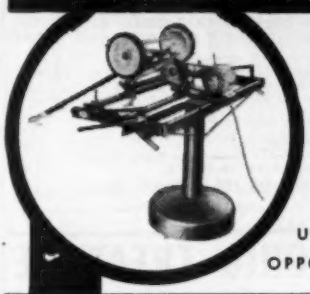
CITY _____ ZONE _____ STATE _____

CAL-AERO TECHNICAL INSTITUTE

GRAND CENTRAL AIR TERMINAL • GLENDALE 1, CALIFORNIA

MAKE UP TO $1000.00

PER MONTH . . . OWN YOUR OWN BUSINESS . . . BE YOUR OWN BOSS



EASY MONEY! — EASY WORK! — UNLIMITED OPPORTUNITIES!

EVERY HOME OWNER A CUSTOMER!

Sign Long Term Profit Making Contracts With Schools, Parks, Playgrounds, Cemeteries, Golf Courses And All Types Of Institutions.

THE MODERN LAWN MOWER SHARPENER IS A PROFIT PRODUCER FOR YOU!

Make more money the Modern way! Everywhere grass grows and lawn mowers are used offers you unlimited opportunities to make up to $1000.00 per month in a business of your own. For the first time in history, you can sharpen any reel type lawn mower from a five inch edger to a thirty-six inch power mower in from ten to twenty minutes. Dismantling is unnecessary. Handle, wheels, roller and motor remain in place when sharpening even the most complicated mower. The Modern Lawn Mower Sharpener eliminates all hand filing. It precision grinds to extreme ends of both left or right twist reel blades. Bottom knife is held in same brackets for sharpening. No extra attachments required for grinding. Hand, power, gang or fairway units sharpened equally fast . . . equally easy for greater profits. Anyone can operate the Modern Lawn Mower Sharpener. It is simple in design and simple to operate. Send for details today!

START YOUR OWN BUSINESS TODAY

SMALL SPACE REQUIRED - SMALL INVESTMENT

Take steps today to start your own business. Send for FREE bulletin on Modern Lawn Mower Sharpener plus FREE booklet on how to organize your business plus ideas and plans for future expansion. Paste completed coupon to penny postcard and mail today!

MAIL TODAY

MODERN MANUFACTURING COMPANY

160 N. FAIR OAKS AVE., PASADENA 1, CALIF

Gentlemen: Please send me your FREE booklets No. 11 and 11A.

NAME _____

ADDRESS _____

CITY _____ STATE _____

COMPLETE LOCKSMITH SHOP ONLY $98.00

ALL POPULAR STANDARD EQUIPMENT

START YOUR SHOP NOW! At Home, Garage, Basement, or Rent a Small Store or Shop

OUTFIT INCLUDES:

- ONE NUMBER 50 PRECISION KEY MACHINE
- ONE HUNDRED DOZEN POPULAR KEY BLANKS
- ONE KEY BOARD WITH 100 KEY HOOKS
- THREE POPULAR LOCKSMITH BOOKS
- ONE SET OF LOCK PICKS
- ONE AUTOMATIC PARTS SERVICE MANUAL
- TWO LOCKSMITHS' WARDING FILES
- BIG ASSORTMENT OF PARTS AND TOOLS
- ALL NEW MERCHANDISE

ALL FOR $98.00 COMPLETE

Slightly Higher Out of U.S.A. Worth Over $150.00. 25% Deposit on C.O.D. Orders.
Start Making Money At Once. Order Your Outfit Today. Satisfaction Guaranteed. Send For Catalog.

REPAIR SHOP SERVICE, Box 264-R, Skokie, Illinois

ELECTRONIC TREASURE DETECTOR $12.74

Used by the armed forces in campaigns all over the world, for locating intricately hidden mines, the AN/PRS-1 detector can perform an amazingly great number of duties for you. It can locate buried treasure, buried water pockets, water pipes, tree stumps . . . everything: whether metallic or not, as long as it has bulk. Every home owner, camper, and prospector needs one. The detector uses headphones and meter for both aural and visual indication. All units include detector unit and amplifier, all tubes, cables, etc.

New, complete $12.74
With Batteries $21.76

ALL MERCHANDISE GUARANTEED. Mail orders promptly filled. All prices F.O.B. New York City. Send Money Order or Check. Shipping charges sent C.O.D.

Communications Equipment Co.
131-P Liberty St., New York City 7, N. Y., Digby 9-4124

NEW 30" SHEET METAL BRAKE

Forms angles, channels, vees, flanges, locks, gees, boxes. Handles 26 gage sheet steel, heavier gages of aluminum, copper, plastic, etc. Portable. Can be held in a bench vise, or bolted down. All steel construction. Wt. 40 lbs. Shipped exp. collect. ONLY **$24.50**

12" BRAKE. Cast iron and steel construction. Price $14.50 PP.

18" CURVE FORMER. Forms cylinders, round corners and cones in sheet metal and strap iron. Price, $10.00 PP.

VISE IRON BENDER. Forms rings, hooks, eyelets, etc. in ½" round or square; ¼" up to 2" wide in bar iron. All steel construction. 8 parts. Price $10.00 PP.

SHEET METAL PLIERS, 3½". Forms angles and channels. $2.00. Sheet Metal and Wire Forming booklet. 50c.

Immediate delivery. Order direct, cash or C.O.D., or send for folder.

VISE BRAKE MFG. CO., 1318 So. 30th Ave., Omaha 5, Nebr.

NEW! MINIATURE DUST MASK

Wear when sanding, grinding, paint spraying, sweeping, dusting, furnace cleaning, etc. Handy as a pair of glasses. Just keep mouth closed and breathe through nose (a all you do to operate. Protects against nuisance dusts, lint, coal, cement, grain dust, Hay Fever Pollen. Has 9 sq. in. filter.

For EYE protection against paint spray, dusts, gases, fumes, smoke, order our Fog-Proof Rubber GOGGLES . . . . . *$3.50 p.p.*

Order Today $1.00 POST PAID

JERRY BRYANT, Dept. PS, 918 N. Michigan Ave., Chicago 11, Ill.

Say You Saw
It In Popular Science

COMBAT JUDO

Fiercest fighting technique known. Learn trick knock-outs, police tactics, and the art of Defense and Attack. Expert instructions in THREE volumes with 200 photographs and illustrations. Complete . . **only $2.25**

VARIETY HOUSE
Box 46-AC Wall St. Sta., New York 5, N. Y.

Now a DYNAMIC Industrial Transformer Type Super Charged WELDER

FOR AUTO, HOME APPLIANCE AND FARM REPAIRS

DESIGNED TO DO HIGH GRADE WELDING *inexpensively*—Maintenance Men, Farmers, Mechanics, Machine Shops, Foundries, Auto, General Repair and Job Welding Shops, all using the DYNAMIC find it so indispensable and useful that they can't afford to be without it. **EASY-TO-OPERATE.** If inexperienced you can easily learn to do a variety of high grade welding jobs by following the practical, *simplified Welding and Operating instructions furnished.* Once you see the DYNAMIC in operation you won't want to be without it. Its simplicity will amaze you. In a year the DYNAMIC only costs you about 7c a day. Comes complete ready to operate with helmet, rods, cable, holder, operating and welding instructions, etc.

Saves You Valuable Time and Money!

This portable, industrial transformer type *Dynamic Welder* easily carried right to the job can be operated from any convenient properly wired 110 Volt 60 Cycle Line. **WORKS on IRON, STEEL, BRASS, BRONZE and Other Metals.** Has 8 metallic and carbon arc heat stages. Does work you would think only possible with a larger more expensive machine . . . Can also be supplied for 220 VOLT 60 CYCLE operation and other voltages and cycles at slight additional cost.

FOR ONLY **$28.50** COMPLETE

DO YOUR OWN WELDING

Just a few repair jobs will pay for this machine. A practical and profitable machine tool for any workshop. Make money doing repair work for others.

Write for Particulars

Get Details on our 10 day Trial Offer

Member Chicago Association of Commerce.

DYNAMIC WELDER CO., 15 East 23rd Street, AB, CHICAGO 16, ILL.

Yes, Stanley Piaskowski made an Important Decision

• Mr. Piaskowski is not the president of a bank or a railroad. He is just an ambitious young man who faced a problem that may be very similar to the one you are facing today. He wasn't kidding himself and he didn't want others to kid him. All he wanted was a really worthwhile job—one that paid a good salary, offered him reasonable security, and a chance to advance to higher pay.

He decided to enroll for C.T.I. training. Now, a graduate, he writes as follows: "I have worked myself up to chief body man of this organization and I like my work very much . . . my average salary is now close to $80.00 a week."

We believe the same opportunities that were within the reach of this C.T.I. man are within the reach of other ambitious men. We can give you the same help we gave him. We invite you to send for our FREE booklet and other information. The request for information does not obligate you in any way. MAIL THE COUPON TODAY.

VETERANS—C.T.I. Courses are approved under the G.I. Bill. Just mail coupon, we will handle all details. .

NON-VETERANS—Don't let the lack of ready cash prevent you from taking this training now. Investigate our Low Easy Payment Plan and our Pay After Graduation Plan.

Mail Coupon for FREE Booklet

Train at Home or in Big C. T. I. Shops

Home of C.T.I.

Large, modern, well equipped shops. Located in excellent residential district only 1 block from Lake Michigan.

COMMERCIAL TRADES INSTITUTE, Dept. E-11
1400 W. Greenleaf Avenue, Chicago 26, Illinois

FILL OUT · CUT OUT · MAIL TODAY!

FACTS FREE FOR MEN WHO WANT TO GET AHEAD
COMMERCIAL TRADES INSTITUTE, Dept. E1-3
1400 W. Greenleaf, Chicago 26, Ill.

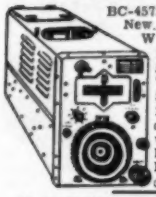
Send free illustrated Brochures and other information about the field I have checked below.

☐ Refrigeration and Air Conditioning ☐ Automotive Mechanics
☐ Electricity ☐ Diesel Mechanics ☐ Body & Fender Rebuilding
☐ Radio Servicing ☐ Building Construction

Name .....
Address .....
City ..... State .....
☐ Veteran ☐ Non-Veteran

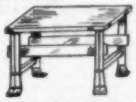
SENSATIONAL SURPLUS BARGAINS

RADIO TRANSMITTER



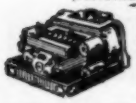
BC-457A. Brand New. Mfrd. by Western Electric. 5 Tubes. Tunes 4 to 5.3 M. C.-27V. Easily converted. weighs 10 lbs., FOB. K.C. Price only **$8.50**

WORK BENCH
All Steel



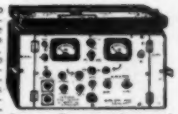
Used — But excellent condition (Govt. Surplus). A Heavy duty steel bench. 36" wide x 36" high x 72" long. Suitable for every type of bench work, home workshop, etc. Top ⅛" steel plate. 2½" Angle iron legs. Weighs 340 lbs. They are not crated or knocked down. Prices FOB. K. C. **$36.30**

C-1 GYRO PILOT
(Automatic)



Complete-kit includes: 3 Stabilizers, motor driven. Electric Gyro inverter. Rotaryconverter DC to AC. Westinghouse. All in 2 shelve Steel Box. Costs Govt. thousands of dollars. FOB. K. C. Our price only **$29.95**

INTERVALOMETER TESTER



Used to calibrate Bomb Sights. Has two Hickock meters, has Switches, Resistors, fuses, Cannon plug and cord. Is carrying case which can easily be converted into testing kit. Complete. Costs Govt. hundreds of dollars. Weighs 65 lbs. FOB. K. C. Only **$14.95**

NEW FLASHLIGHT

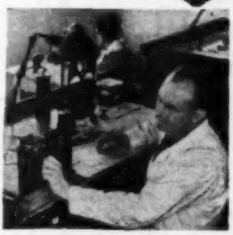
Govt. Surplus. Lights up the "Hard-to-get-at" places. Fine for mechanics, electricians, filling stations, home and many other uses. Plastic 12" extension (6" stiff and 6" flexible.) Adjustable to any angle. Originally over $4.00. Postpaid..... **$1.80 Ea.**

Write for descriptive list of other Surplus Items
National Surplus Sales Co. 1810 Charlotte Kansas City 8, Mo.

IS YOUR FUTURE

like this ➡

OR like this ⬇



Be a MASTER AIRCRAFT INSTRUMENT TECHNICIAN for a secure, profitable future

Thirty-four weeks' intensive training — Line maintenance, Servicing, Repairing, Testing, Mechanical, Pressure, Gyroscope and Electrical Instrument Groups.

Many applications to other industrial instrument fields.

Approved for VETERANS and NON-VETERANS

Members NATIONAL COUNCIL TECHNICAL SCHOOLS
C.A.A. Instrument Repair Station No. 1028

MAIL COUPON BELOW FOR FREE BOOKLET

American Schools of Aircraft Instruments
5145 West San Fernando Road, Dept. PS-38
Los Angeles 28, California
Please send me FREE and without obligation, illustrated booklet describing Aircraft Instrument Field.

Name ..... **Age** .....
Address ..... **Zone** .....
City ..... **State** .....
Veteran ..... **Non-veteran** .....

EVERYTHING IN

RADIO

AND ELECTRONICS in **ONE** book!

Over 1000 pages

All the expert knowledge at your fingertips . . . quick to find . . . easy to read in the

RADIO DATA BOOK

This new radio bible will be your lifelong tool. You will use it every day for every operation in radio and electronics. The **RADIO DATA BOOK** provides complete information on any radio subject . . . in clear-cut, easy-to-understand, completely illustrated style. It is a complete course in radio for the beginner . . . it is packed with money-making knowledge for the professional . . and it is a complete reference for the master. Advance sale, only 10,000 available—to make sure you get your copy of the **RADIO DATA BOOK** send in your order now!

12 Sections . . . Over 1000 pages Completely illustrated.
Section 1. The 150 Basic Circuits in Radio.
Section 2. Complete Test Equipment data.
Section 3. Testing, Measuring and Alignment.
Section 4. All About Antennas.
Section 5. Sound Systems.
Section 6. Recording.
Section 7. Complete Tube Manual.
Section 8. Charts, Graphs and Curves.
Section 9. Codes, Symbols and Standards.
Section 10. 50 Tested Circuits designed for optimum performance.
Section 11. Dictionary of Radio and Electronic Terms.
Section 12. Radio Book Bibliography.

Handsomely bound in red and gold—12 complete books in one, only $5.00—less than 42c per book!—Satisfaction guaranteed—or your money back.

BOLAND & BOYCE, INC., PUBLISHERS PS-1
460 Bloomfield Ave., Montclair, N. J.
Send me the RADIO DATA BOOK. Enclosed is $5.00.
NAME .....
ADDRESS .....
CITY ..... ZONE .....
STATE .....
BOLAND & BOYCE INC., PUBLISHERS

Earn BIG PAY Now!

thousands of ambitious men helped

FREE EMPLOYMENT SERVICE

• BIG SHOP TRAINING •

Learn These Trades in the Big Allied Shops

Choose one of these 6 LEADING TRADES
- Machinist Trade
- Tool & Die Making
- Tool & Die Machine Designing
- Mechanical Drafting
- Tool Engineering
- Industrial Product Illustration

Largest School of its Kind in the World

APPROVED FOR VETERANS

FREE! BIG METAL TRADES ILLUSTRATED BOOK

WRITE TODAY: A 1c Postcard will do.

ALLIED SCHOOL OF MECHANICAL TRADES
1338-1340-1342 So. Michigan Ave. Est. 1928
443 Allied Bldg. CHICAGO 5, ILL.

TRAIN

Your VOICE!

Results GUARANTEED

We build, strengthen the vocal organs—not with singing lessons—but by sound, scientifically correct silent and vocal exercises and absolutely guarantee complete satisfaction with results. Write for Voice Book. FREE. Sent to no one under 17 years old unless signed by parent.

Perfect Voice Studios, Studio 1363, Kimball Hall Bldg., Chicago 4, Ill.

ARC WELDER

BUILD YOUR OWN!

For light or heavy work. No rewinding necessary. 16 Heats. Use old auto generator coils. Complete plans and catalog, 35c. **LEJAY MFG. CO., 3323 LeJay Bldg., Minneapolis 8, Minn.**

No Wood-working Shop Complete Without the Electric WONDER PEN

Costs so little, yet enables you to put magic-like professional finishing touches, borders, decorations, etc. on whatever you make. Six interchangeable points for etching (woodburning), embossing, cutting, shading, hole cutting. Simply plug in and use. Guaranteed. Pays for itself the first time used. Complete professional kit in wood chest. Only $2.25, postpaid.

AMERICAN T. & F. CO. 6130 N. Clark St. Dept. 238 Chicago, 26, Ill.

USED BUT REBUILT IN CLEAN, GOOD CONDITION!

ARMY SHOES $2.49 A PAIR

Now you can wear these sturdy, all weather Army Shoes. Will last and stand up under the toughest wear. Fits comfortably, thick soled, strong leather. Russett tan color only. All sizes. Valued about $5 a pair. Now only $2.49 a pair. Send shoe size, name and address. SEND NO MONEY! Pay postman on delivery $2.49 plus postage. Satisfaction Guaranteed Order Now! Also send for our free catalog of shoes, hats, suits, army clothes, etc.

EUNICE MAIL ORDER HOUSE
Station B, P.O. Box 101, Dept. PS-C N. Y. C.

6 NEW GADGETS FOR $1.00

Join the Gadget-of-the-Month Club **today** and receive a new, exclusive, and useful gadget every month for the next six months, postpaid! This coupon and one dollar pays for your six month's trial membership. Ten days after receipt of your order, Gadget-of-the-Month Club will send you the first of the six helpful, handy gadgets, and one each month for the next five months! The total retail price of the six gadgets is **guaranteed** to be far greater than your dollar membership fee, **or your money will be cheerfully refunded!**

JOIN NOW! CLIP this coupon

GADGET-OF-THE-MONTH CLUB
P. O. BOX 2000, LOS ANGELES 54, CALIFORNIA

Name _____
Address _____
City _____
Occupation _____ Age _____

Say You Saw It In Popular Science

25 PHOTO STUDIES

BY PROFESSIONAL MODELS

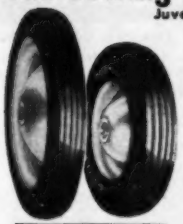
NOW IN FULL COLOR

No artist should be without these perfect Figure Studies of Hollywood Beauties in bright life color! On 35MM Film strip, complete with ready mounts. Order now. $10 Value for only $2.95. New series released monthly. At your dealers or write us direct.

Deluxe Magnif-ing Viewer
For Perfect Figure Details $1.00
(when ordered with above film.)
Viewer sold separately $1.50
25 Houston Plastic ready mounts, permanent, will not bend $1.00
Write for catalog of other Entertaining Art Subjects, Slides, Films, etc.

BENEFIT FILM CORP., Dept. 1
3807 Benefit St., Balto.-24, Md.

Ball-Bearing SPEED WHEELS



Juvenile wheels, solid tire—No Bearings

7" wheels.....60c
6" wheels.....50c
4" wheels.....30c

Semi-pneumatic tired wheels

12 x 1.75".....$3.25
10 x 1.75".....$2.75
10 x 1.25".....$2.00
8 x 2".....$2.00

Industrial wheels for heavy loads
Semi-Pneumatic

400 x 8, 2 ply tire and tube $12.50
10 x 2.75" Hollow Core.....$6.75
10 x 2.75" Single Tube.....$7.25
12 x 3.00 wheel bolted hub $9.75
8 x 2.50".....$4.90
6 x 2" spot welded.....$2.80
6 x 2" lug base @.....$3.30

Dealers and Manufacturers Inquiries Invited

Free blueprints with all wheel orders.
Send check with order. Shipments f.o.b. Akron.

JIM BROWN TOY COMPANY
1093 Home Ave. Akron 10, Ohio

NEW B-M POWER MOWERS

AT LOW FACTORY COST

For Modern Lawn Care. Newest model self-drive, three-wheel, rotary blade mower. Equipped with quick-starting, dependable, trouble-free 1½-2 h.p. Clinton engine. Light. Sturdy. Choose from three models of assembled mowers or Build-It-yourself kit of parts. **Guaranteed. FREE literature.**

B-M MOWER COMPANY
Box 66-S Blue Mound, Kansas

KIDNEYS MUST REMOVE EXCESS ACIDS

Help 15 Miles of Kidney Tubes Flush Out Poisonous Waste

If you have an excess of acids in your blood, your 15 miles of kidney tubes may be over-worked. These tiny filters and tubes are working day and night to help Nature rid your system of excess acids and poisonous waste.

When disorder of kidney function permits poisonous matter to remain in your blood, it may cause nagging backache, rheumatic pains, leg pains, loss of pep and energy, getting up nights, swelling, puffiness under the eyes, headaches and dizziness.

Kidneys may need help the same as bowels, so ask your druggist for Doan's Pills, a stimulant diuretic, used successfully by millions for over 50 years. Doan's give happy relief and will help the 15 miles of kidney tubes flush out poisonous waste from your blood. Get Doan's Pills.

GLOWS in the DARK

AMAZING LUMINOUS PAINT

GLOWS IN THE DARK New, different, now available in 3 pastel shades, blue, green and orange. Three large bottles postpaid only **$1.00**, dealer carton of twelve $2.76. Many uses: art, advertising, plastics, toys, novelties, house numbers, light switches, greeting cards, decals, ornaments.

Dealer and jobber inquiries invited.

THE LUMINOUS PRODUCTS CO. 1978 Sterling St., Phila. 38, Pa.

BE A CLERK *all my life?* NOT ME!!

Of course you say you won't.

But you may be unless you do something about it.

Hoping and wishing won't get you a better job and more money.

You must prepare for that step ahead—be ready to make promotion come.

We have helped thousands of ambitious men and women get ahead in the business world—perhaps we can help you.

At least you should investigate. It may be the turning point in your life to a better job and more money. So send the coupon without delay. Check the field of your choice and we'll send you without obligation the requirements and opportunities in that field.

LASALLE Extension University
A Correspondence Institution
417 S. Dearborn St., Dept. 383-R Chicago 5, Ill.

I want to know whether you can help me get ahead in the field I have checked below. Send me your free 48-page booklet and full information about your home-study training in that field.

- ☐ Accounting
- ☐ Bookkeeping
- ☐ C.P.A. Coaching
- ☐ Law: LL.B. degree
- ☐ Salesmanship
- ☐ Stenotypy (Machine Shorthand)
- ☐ Business English
- ☐ Effective Speaking
- ☐ Industrial Management
- ☐ Business Management
- ☐ Traffic Management
- ☐ Foremanship

Name.....*Age*.....

Position.....

Address.....

City.....*Zone*.....*State*.....

WAR SURPLUS! AMAZING! 2 WAY COMMUNICATION WITHOUT BATTERIES OR ELECTRICITY!

U. S. Infantry & Armed Forces

SOUND POWERED PHONES

PERFECT TO ONE MILE!

HERE are battle proven U.S Infantry & Armed Forces **SOUND POWERED PHONES.** Ideal communication from house to garage, to workshop, to barn, to field. Just hook up to any 2 strand wire. **NO BATTERIES OR ELECTRICITY NEEDED.** 2 Magnetic type receivers for hearing & speaking. Adjustable headbands Simple to Operate.

- Practically "Flat" from 50 to 10,000 cycles
- Use it as an amplifier
- Makes excellent Microphone
- Makes wonderful set of earphones for use with radios or crystal sets.
- Complete with instructions
- COST GOV. APPROX. $7.00 PER SET

2 STRAND WIRE . . . Weatherproof 2c PER FT. Plus 35c postage per 100 ft.

$2.95 FOR 2 COMPLETE SETS POSTAGE PREPAID

17 JEWEL WRIST WATCH

SERVICE PRECISION WATCH

SWISS MOVEMENT-INCABLOC

- WATERPROOF
- SHOCKPROOF
- SWEEP SECOND HAND
- RADIUM DIAL
- STAINLESS STEEL BACK
- LEATHER STRAP

Brand New . . . Complete satisfaction-guaranteed or money refunded.

A GREAT VALUE

$19.95 A regular $50.00 value

Add 10% Fed. Tax plus 25c postage & insurance

FREE Send for free illustrated catalogue. Has many marvelous War Surplus Bargains.

ALLIED SALES CO.

DEPT. SM 88 CLAY STREET • SAN FRANCISCO 11, CALIFORNIA

Send check or money order. Sorry no C.O.D.s.

LEARN ACCOUNTING SALESMANSHIP SECRETARIAL WORK

Assure Your Future Now!

Hill's, one of America's outstanding Business Schools, offers you the opportunity to enter one of the three fields acknowledged to hold substantial earnings and a secure future. Our FREE book, "Through Hill's to Success," tells how and where the best positions are found and how you can qualify for them by study at home or in our resident school. We have thousands of successful graduates and maintain nationwide employment service. G. I. Approved.

FREE WRITE TODAY

USE THIS HANDY COUPON

HILL'S EXTENSION SCHOOL Dept. PS-3
AND BUSINESS UNIVERSITY
619 W. Main St., Oklahoma City 2, Okla.
Please send me your Free book, "Through Hill's to Success."

NAME_____

ADDRESS_____

CITY_____ STATE_____

BIG PAY TRADE — AIR CONDITIONING REFRIGERATION

Learn at one of America's finest institutions, under expert, experienced instructors.

ACRI will train you for a profitable career in air conditioning and refrigeration. Homes, restaurants, offices, industrial plants, etc., will require air conditioning installations and maintenance. Get in on the ground floor—this is the trade of the future—WITH A FUTURE FOR YOU. If you are a veteran, the government pays you while training—pays your entire school tuition—and buys your tools. Non veterans may arrange easy weekly or monthly payments. Train at ACRI for your future. Write today for FREE catalogue A. ACRI, 110-112-114 N. Paca St., Baltimore 1, Md.

AT HOME COURSE

ACRI also teaches you air conditioning and refrigeration at home. Outstanding opportunities await young men in this great field. Start by training at home—finish in the modern shops of ACRI, where experienced instructors teach you on working machinery. Act now—write today for catalogue B.

AIR CONDITIONING & REFRIGERATION INSTITUTE

110-112-114 N. Paca St. Baltimore 1, Md.

Also Available **PACKAGED BOATS**

Save 50%—Build from our precision cut moulded and sheet plywood Kits—Finest design—Full hardware—Nothing else, to buy—illustrated instructions—$34.50 up —Send 25c (coin) for photos and literature.

MARINE MART — BUFFALO 7, N. Y.

AGENTS WANTED

SELL Certified Fever Thermometers to the home. Big demand, huge profits. Meets U. S. Bureau of Standards specifications. **Buy direct from manufacturer.** Thermometer and case retails for $1.25, costs you 50c. Write for area agency on this and our other products such as chemical indicator kits, pipette and test tube racks, etc. **CERTIFIED INSTRUMENT COMPANY,** 5 Beekman Street, New York 7, N. Y.

ELECTRIC SHEAR SHARPENER

OVER 35,000 SOLD—IT MUST BE GOOD!

Genuine Carborundum wheel ideal for shop or home use. Send remittance with order and shipment will be made at once, prepaid to your door, complete with electrical goods catalogue.

$9.75 complete with vise

WILLIAM MARVY COMPANY, Dept. 6
479 St. Peter Street St. Paul 2, Minn.

AIR FORCE FLIGHT BOOTS

A-6 type, will keep your feet warm and dry in the coldest weather. Genuine shearling fully lined. Rubber soles and zipper closure. Reconditioned like new. State shoe size when ordering.

$6.95

Free catalog of G.I. work clothing.

SURPLUS MERCHANDISE DEALERS, Dept. P. S.
1214 Broadway NEW YORK, N. Y.

BE AN ARTIST! EARN BIG MONEY!

Now you can really teach yourself to be an artist with the help of one of the leading art directors. Special simplified quick course, showing all the short cuts to becoming a big time artist. Learn to draw and paint for magazines, advertisements, etc

10 COMPLETE LESSONS including actual artists' sketches and example drawings on real art board—figure drawings from live models, art poses, anatomy, cartoons, caricatures and many others.

OVER 300 ILLUSTRATIONS *Extra! For Prompt Action*

5 COMPLETE ART BOOKS

ON ALL SUBJECTS OF ART EVERYTHING POSTPAID

MONEY BACK GUARANTEE! Fill out coupon, enclose in envelope with TWO DOLLARS cash or money order and mail to

HOLLYWOOD ARTISTS, Studio B
P. O. Box 2344, Los Angeles 54, Calif.

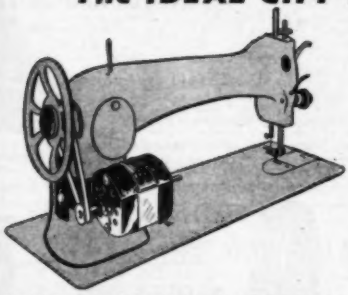
NAME_____

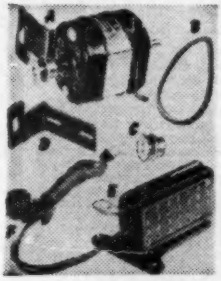
ADDRESS_____

COMPLETE COURSE POSTPAID $2.00

ELECTRIFY Your Sewing Machine With a "SEWING MACHINE MOTOR KIT"

The IDEAL GIFT for Mother... Wife... Sister!





$17.75 COMPLETE

ADJUSTABLE FOR USE WITH ANY TYPE OF SEWING MACHINE

ANYBODY CAN INSTALL IT!

Takes but a few seconds

COMPLETE SET CONSISTS OF:
(A) MOTOR & BRACKET—Universal AC or DC, 60 cycle, 115 Volts. (B) BELT—Long Wearing Rubber Belt. (C) PULLEY—Single Grooved Steel Hubbed Pulley. (D) BRACKET—New and Improved. (E) FOOT CONTROL—7 Step Rheostat. (F) CORD SET—Extension Cord fitted with plug and socket. (G) Installation Instruction Sheet.
SPECIAL NOTE: This 1/20 H.P. motor with double end shaft and rheostat can be used in all hobby workshops for flexible shaft attachments, grinding, drilling etc.

Special Offering to DEALERS!

MAIL THIS COUPON

Dept. PS-2 **BROWNELL DISTRIBUTORS, INC.**
308 Canal St., New York 13, N. Y.

Please rush_____motor kits at $17.75 each (postage prepaid) in:
☐ money order or ☐ check
☐ send C.O.D.—and I'll pay postman $17.75 plus C.O.D. fees.

Name_____
Address_____
City_____Zone____State____

APPLIANCE REPAIRMEN

MONEY SAVING PRICES — IMMEDIATE DELIVERY

IRON REPAIR KIT

Contains a complete assortment of terminals, pins, porcelain insulators, mica, etc., that will fit most "flat" irons and appliances. Practically every part necessary in the ordinary repairing of flat irons in one handy kit. Additional supplies obtainable so that your kit can be kept replenished. Entire kit sent postpaid for only $3.10 plus 18c postage.

Electrical Appliance Repair Parts

Lead Wire. Asbestos covered heater hook-up wire. 10 ft. $1.00
Heating element wire. 10 ft. coiled ¼" O.D. #20 ..... 2.55
Heating element wire. 10 ft. coiled 3/16" O.D. #22 ..... 1.77
Ribbon element heating wire. Std. size 100 ft. ..... .75
Christy Electric Heating Element Welding FLUX for repairing flat irons, toasters, electric stoves, etc. Enough for 50 elements 1.00
Hot plate bricks 5¾" diameter. 6 for 1.62
Carbon brush set. Assorted, 104 brushes, 15 Springs. Complete 3.00
Kerosene to Electric Lamp conversion adapters. 5 for only 1.00

Repair Elements for Electrical Appliances

Electric Range Elements. Fit all makes. Latest Super-high speed units. Each 6.30
Renuall Iron element. Guar. 1 year. Package of 6 ..... 3.12
Irons. Porcelain shoes for 500-600 watt. Set of 4 ..... 1.00
Percolator elements. Universal flat type. 1 Yr. guar. 2 for 1.20
Percolator Element. Porcelain for new glass types. 2 for 1.80
Element cement. Withstand 3000° F. 1 lb. package 1.00
Toaster element forms. Clear Mica. Fits most toasters. 10 for 1.80

HOW TO FIX IT BOOKS

Modern Electric & Gas Refrigeration—928 pages 5.00
Armature & Magnet Winding—270 pages 1.50
Practical Elec. & House Wiring—200 pages, 227 illustrations 1.50

Here is your opportunity to save on repairing your own appliances and to earn extra money repairing appliances for friends and neighbors.

CHRISTY SUPPLY CO.
2835 N. Central Ave. Dept. T-1051 Chicago 34, Ill.

Don't be a fellow who "never had a chance"—for your big chance is right here now—in Drafting. The field for draftsmen is bigger now than ever before, for drafting is the basic profession and all new products start with the draftsman.

Get into Drafting now. I will train you at home, in your spare time and give you actual experience on actual work—the same kind of jobs you will do for the best paying firms. I will train you until you are competent, fully experienced and holding a position that will bring advancement and pay raises as deserved. Write me today!

WORKING TOOLS INCLUDED

You get drafting instruments, table and other equipment when you start. Nothing for you to buy.

EXPERIENCE WHILE LEARNING

Don't forget! - train you through practical jobs—I give you experience. And I list this experience as a reference to employers when you are ready to go to work. Lack of starting knowledge or higher education should not hold you back. Low cost—and monthly payments, if desired.

ACT NOW!

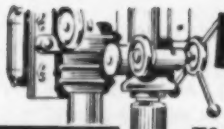
Mail coupon to me today! No salesman will call, but you will get my big book and all details. Give your age to get reply.

MAIL COUPON FOR VITAL FACTS

Engineer Dobe, Div. 23, Libertyville, Ill.

Send me the Vital Facts on Drafting and Industrial Designing, your Free Book and advertised list of positions for Draftsmen and Designers wanted.

Name..... Age.....
Address.....
City..... Zone..... State.....



NEW!

HANDY FLEXIBLE SHAFT

ONLY $2.95

- **Converts Any Motor, Drill Press, Electric Drill, Electric Fan Into A Handy Rotary Tool.**
- Attach ROTA-SHAFT in a Jiffy. Can Be Used for Grinding, Polishing, Sharpening, Cleaning, Engraving, Marking Tools, Carving, On Metal, Plastic, Wood, Glass.

OLD FAN MOTOR

YOUR ELECTRIC MOTOR

VACUUM CLEANER MOTOR

YES! Only $2.95 and ROTA-SHAFT turns your old motor, drill press, electric drill or electric fan (10 inch or larger) with blades removed, into an efficient, versatile Flexible Shaft Tool for doing hundreds of grinding, polishing, sharpening jobs, especially in hard-to-get-at places. Attaches to motor shaft or in chuck. Convenient handpiece for ease of handling. Generous 40-inch overall length. Comes complete with buff and sanding disc ready to use in a drill press chuck. Order today.

SEND NO MONEY! Just mail order. Pay postman only $2.95 plus postage on delivery, or send $2.95 and we pay postage. Try 10 Days—if not delighted return for money-back.

If you order Rota-Shaft for use on motor add 35c for Special Coupling and State Shaft Diameter. MAIL ORDER NOW!

STRADER PRODUCTS CO. Dept. A-102
259 Strader Ave. Cincinnati 25, Ohio

ASSEMBLE THIS BEAUTIFUL COLONIAL POST LAMP

- These new kits bring the popular colonial lamp within reach of all craftsmen. Complete instructions furnished, all parts correctly sized and formed, 16" high, 10" square, 3" post diam. These rugged lamps make ideal gifts.

Kit No. 1. You solder frame. **$7.95** each
Kit No. 2. Frame ready-welded, you complete job with screwdriver. **$9.95** each
Complete Lamp as shown, finished in dull black, ready to install, less bulb. . . **$16.95**
We pay postage, money-back guarantee. Send check or money order, or ask for free literature.

LORENZEN INDUSTRIES, Dept. PS, Niles, Mich.

OUR MONTHLY SPECIAL

5 Inch Cathode Ray, Type 5BP1 tubes. In their original cartons. Brand New. At this price every scope owner should buy a few and keep in reserve. How can you go wrong for only **$1.95**

MICHAEL STAHL, Inc.
39 Vesey Street
New York 7, N. Y. Dept. P.S. 3

$19.95

PORTABLE PHONOGRAPH

3 Tube Amplifier, Volume and Tone Controls, 5" Alnico P M. Speaker. Light weight crystal pickup, heavy duty motor. A.C. operation only. Handsome luggage type carrying case.

Kit form $17.50 **Completely assembled $19.95**
Table Model Phonograph—Same as above, with Walnut finish cabinet.
Kit form $16.50 **Completely assembled $18.50**
Record Player—attach to any radio $9.95

PHONO AMPLIFIER KITS

3 Tube Phono Amplifier, Tone and Volume Controls
Kit form..... **$2.35** Wired and tested **$2.85**
3 Tubes for above 12Sk7, 50L6, 35Z5..... **$1.75**
5" Alnico Permanent Magnetic Speaker and Transformer ..... **$ 1.95**
Astatic or Shure Crystal Pickup..... **$ 1.95**
Self Starting Phono Motor..... **$ 3.25**
V.M. Automatic Record Changer **$16.95**

WRITE FOR FREE CATALOG
25% deposit on C.O.D. orders
ORDER FROM THIS ADVERTISEMENT

RAYTONE ELECTRONIC COMPANY 25 S Frankfort Street New York 7, N. Y.

WHY PAY MORE?
FREE TUBE
With Each Order

EVERY TIRE GUARANTEED
90% NON SKID, ORIGINAL TREAD
TRIPLE INSPECTED DEMONSTRATORS

Positively Not Re-caps!

600-16	$6.35	700-15	$6.55
650-15	5.35	700-16	6.95
650-16	6.45	750-16	7.95
32x6-6	$12.35	8.25-20	$17.45
32x6-10	14.35	9.00-20	17.65
750-20HD	14.35	10.00-20	17.95

750-20 8 PLY MILITARY SUPER $15.95

½ million tires shipped to satisfied customers. Trial will convince you. Mail Orders. Rushed on Receipt of Check or Money Order.

STANDARD TIRE
834 N Broad St. Phila. 30, Pa.

Say You Saw
It In Popular Science

TRIM YOUR OWN

TRIM HAIR AT HOME—SAVE BARBER BILLS

Trims hair as it combs! Easy! Quick! Keeps men's, women's, children's hair trim, neat, freshly-cut looking all the time! Trims, tapers, thins out unruly hair. Use like ordinary comb. Safe. Simple. No experience required. Fine for legs, underarms! *Sells Like Wild!*

SAMPLES for AGENTS

Sample offer sent immediately to all who send name at once. Penny postal will do. SEND NO MONEY.

Just your name. **KRISTEE CO.**
701 BAR ST., AKRON, OHIO

How to Make Liquid Marble

And BIG PROFITS In Your Own Business

Amazing Liquid Synthetic Marble can be made at home without machinery. Needs no heat or pressure. Can be poured into molds for casting expensive novelties. Liquid Synthetic Marble can be made in any color. It is even *more beautiful than genuine marble* because of its highly glazed finish. Costs far less. **FLEXIBLE MOLDS:** Make your own Flexible Molds. Cast novelties, statuary, desk sets, book-ends, etc., out of Liquid Marble, plaster and many other molding compositions. A large sized mold costs but a few cents. Hundreds of casts can be taken from a single mold. **UNLIMITED MARKET:** You will find steady year-round demand in your own community. No selling problem. We supply names of buyers for your finished products. Let **BING PRODUCTS** show you how to start with a small investment and build a permanent, independent, profitable business!

Write now for **FREE CATALOG!**

BING PRODUCTS: Dept. B29 88 Broad Street Boston 10, Mass.

DELCO MOTORS

1/75 H.P. Delco Motor—For cooling, ventilating and heating purposes. All are factory tested and guaranteed. Quiet operation. Triple rubber mountings. Horseshoe stand. 110 V.A.C., 60 Cy., 1000 C.F.M. 6 blade fan 7½"—stand 6¼". 4½" wide. Complete as shown. Shp. Wt. 5 lbs.

No. 7014 Suction Type
No. 9272 Blower Type....EACH $5.25

Lots of 10.....Each $4.90 Lots of 50.....Each $4.75
Plus Postage

FREE CATALOG—Send for new G. & E. Appliance & Parts Catalog

G. & E. EQUIPMENT SUPPLY CO.
Dept. P.S.2, Ogden Ave. at Fulton, Chicago 7, Illinois

BUILD YOUR OWN ENLARGER

Enjoy Photography's most fascinating hobby at a fraction of usual cost. With simple step-by-step instructions and diagrams plus a screwdriver and pliers you assemble your own Enlarger and Save! Get all features of more expensive Enlargers: precision machined aluminum alloy castings, 90° tilt for wall projection of prints, spherical aluminum lamphouse, helical rack and pinion focusing with extra large knobs, unconditional guarantee.

Write Today for Free Illustrated Folder

CALIFORNIA TECHNICAL PRODUCTS CO.
8510 Warner Drive, Dept. K-3, Culver City, Calif.

REAL DIESEL ENGINE

For Model Planes, Boats and Race Cars. Now you can own and run a real miniature Diesel engine that operates by the heat of compression. No coil, condenser, wires, or annoying ignition failures. Simply flip the prop or flywheel to start. It's the new DEEZIL—a .125 cu. in. displacement, 5 oz. engine that runs at 8000 RPM. Order today; only $12.95 p.p., less tank. Every engine fully tested and guaranteed. DEEZILMIX FUEL $1.00; PROP 50c.

GOTHAM HOBBY
107 East 126th Street New York 35, N.Y. Dep't S

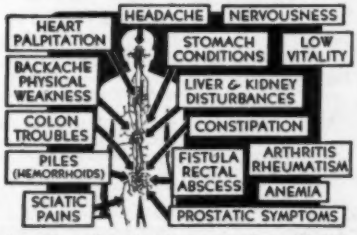
ITALIAN ACCORDIONS

All types, all models. Very best. Hand made, lowest prices. Buy direct from Factory representative and save money. Send name and address for free catalog.

ITALIAN ACCORDION MFG. CO.
7600 Cottage Grove Ave., Dept. PS-3, Chicago 19, Ill.

Get Facts About Fistula — FREE

NEW BOOK—Explains Causes and Latest Treatment



Illustrated, authentic 40-page book on Fistula, Piles (Hemorrhoids), related ailments as shown in diagram and colon disorders is yours FREE. Send postcard to Thornton & Minor Clinic, Suite 349, 349 McGee St., Kansas City, Mo.

WAR-SURPLUS BARGAINS

AUTOMATIC PILOT UNITS

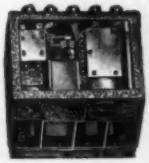
A $2500.00 Value for Only $16.30

Items 2, 3, 4 and 6 are all Automatic Pilot items—all brand new—all in perfect condition. Original acquisition cost was approx. $2500.00. Now as surplus you can buy the lot for only $16.30. It brings you hundreds of valuable parts—mechanical, electrical and electronic. Inventors, experimenters, etc., will find the value of a lifetime in this assortment.

SERVO ACTUATING UNIT

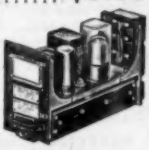
A combination hydraulic and electrical actuating unit that includes a 1/10th horse power (6000 RPM) 24 volt motor. May be adapted to many uses such as operating garage doors, gates, etc. All units are brand new and guaranteed perfect. Shipping weight approximately 27 pounds. **Item No. 2—** Each..... **$4.95**

AMPLIFIER RACK



Sperry A-5 Auto Pilot assembly. Includes a great array of valuable electronic parts such as a 2¼ inch 0-120 AC volt meter, 3¼ inch, 350-450 frequency meter, plus relays, capacitors, resistors, condensers, plugs, switches, etc. Measures 14x10x12 inches. Approximate shipping weight 30 pounds. The meters alone are worth more than the price quoted for the complete assembly. **Item No. 3—**Each only..... **$5.95**

POWER AMPLIFIER

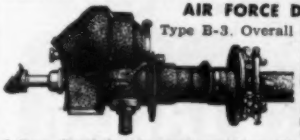


A 4 tube power amplifier (not audio) that contains a compact assembly of condensers, transformers, switches, resistors, sockets, terminal strips, chassis and panel. A real value for the radio and electronic experimenter. Shipping weight approximately 5 pounds. **Item No. 4—**Each only.. **$1.45**

CONTROL UNIT AND PANEL

Made by Sperry. Designed to provide electronic control for the various units of the auto pilot. Measures 7½ x 8 x 4½ inches. Includes 6 toggle switches, 2 three-way switches, 3 dial indicators, plugs, resistors, etc. Parts alone are worth many times this low price. Shp. wgt. 8 pounds. **Item No. 6—** Each..... **$3.95**

AIR FORCE DRIFT METER



Type B-3. Overall length 47 inches, tube length 27 inches. Used in navigation of bombers. Includes valuable lenses, prisms, electric gyro, etc. Original cost hundreds of dollars. Used, but in good condition. Shp. wgt. approx. 50 pounds. **Item No. 7—**Each only... **$9.95**

ALUMINUM CLAMP KIT

No. 5—Over 600 metal, rubber bonded clamps; six sizes up to 1⅜ inch. Shp. wgt. 15 lbs. Only.. **$6.50**

SCREW & RIVET ASS'T.

No. 4—Over 15,000 pieces. Includes 10 sizes mach. screws—also 10 styles and sizes alum. rivets. Separately bagged and packed in a steel tool chest 7x17x16 in. Wgt. 30 lbs. Only..... **$6.50**

HYDRAULIC PUMP

No. 1—New, gear type hydraulic pump; 1000 p.s.i., pulley drive. (Pulley not included). Ideal for hydraulic rams, struts, concrete machine (blocks) or any place power is needed. Built by Pesco. Readily converted for use as sump pump. Shp. wt. 5 lbs. Each **$9.95**

AIRPLANE GENERATOR

No. 2—Ideal for use on boats, trucks, light and power plants, light welders, water wheels, etc. 24 volts, 25 amps, RPM 2500. ⅞ inch diam. shaft. Measures 10x5 in. diam. Actual weight 23½ lbs. Guaranteed brand new. Shp. wt. 28 lbs. Two for $30.00. Each..... **$17.50**

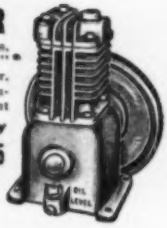
All F.O.B. Houston. Mail orders promptly filled. Send check or money order. Satisfaction guaranteed.

AERO INSTRUMENT COMPANY, Dept. PS 3
MUNICIPAL AIRPORT HOUSTON, TEXAS

AIR COMPRESSOR

Piston type, size 2x1¾, head in valves, bronze bearings splash lubrication. "V" Belt drive. Intake muffler and cleaner. Capacity 2.8 c.f.m. at 100 lbs. continuous pressure, or 150 lbs. Intermittent pressure with ½ HP motor. Can be used with ¼ HP at lower speed. Weight 24 lbs.

Price Only **$17.95**



AUTOMATIC PRESSURE SWITCH WITH UNLOADER

125 to 150 lb. Pressure. Use with ¼ to 5 HP Unit.

Only **$7.95**

¼" air check valve.... $2.30
½" air check valve.... 4.25
2½" air gauge, 160 lb.. 1.75
¼" safety valve, 125 lb. pressure..... 1.50

¼" REDUCING VALVE & GAUGE

$5.75

Oil resistant, pressure 0-to-200 lb. Reduced pressure 0-to-75 lb.; 3 outlets ¼". Wt. 2 lbs.

FLEXIBLE SHAFT

Only **$16.50**

6 ft. Stow or Mall Flexible Shaft, Heavy Duty, 3/16" Core. Best piano wire. Ball bearing handle and arbor, rubber covered housing; for ½" motor shaft; for 1½" bore wheels. Operates on ¼ H.P. Motor at 1725 or 3450 R.P.M. $29.00 Value, only $16.50. Wt. 8 lbs.

MOTOR

$2.45

1/30 HP 24 volt DC motor 2450 R.P.M. .95 amps. ½" shaft size overall 3" x 4". Weight 3 lbs. Also operates on 32 volts.

HEAVY DUTY MOTORS

Nationally known makes. Guaranteed capacitor type, ball bearing heavy duty motors. 110/220 volts. 60 Cycle AC Single Phase. 1725 RPM.

1/4 HP	Wt. 30 lbs.	$24.00
1/2 HP	Wt. 38 lbs.	$34.50
3/4 HP	Wt. 50 lbs.	$44.00
1 HP	Wt. 60 lbs.	$57.00

These motors also furnished in 3450 R.P.M. at same price.

USE AS 6 VOLT GENERATOR

Generate your own power. Can be operated on your bicycle wheel. Furnishes sufficient power for two 6 volt bulbs. Resistor furnished free with each motor enables you to maintain constant voltage. Special Price $2.45, or 4 for $7.50. Write for price in larger quantities.

Prices are F.O.B. Chicago. Immediate delivery. SOLD ON MONEY BACK GUARANTEE. Send check or money order today.
DEALERS — WRITE . . .

C & M EQUIPMENT COMPANY 1831 S. State St., Dept. B-3 Chicago 16, Ill.

LOOK TALLER INSTANTLY!

WEAR HITE-BUILDERS IN YOUR OWN SHOES

Want more respect?... more opportunities? Then increase your height INSTANTLY with Davis Hite-Builders. Slip them inside your own shoes. Invisible . . . comfortable . . . easy to wear. Made to last for years. Amazingly low-priced!

SEND NO MONEY

Rush name, address, and shoe size today. Pay postman only $1.95 plus few cents postage for your pair of Hite-Builders, mailed in plain package. If not delighted with immediate result, just return them and we'll refund your money at once. Or send $1.95 now and save postage. Same guarantee... of course. Order today, look *TALLER* next week!

Only **$1.95** A PAIR

DAVIS MFG. CO.
DEPT. H-341, LOVELAND, OHIO

save MONEY ON ALL STANDARD BRAND CIGARETTES

LUCKIES — CHESTERFIELDS
CAMELS — PHILIP MORRIS
OLD GOLDS — PALL MALL
and others

$1.41 CARTON 10 PACKS

SHIPPED SAME DAY
TO ANY PART IN U. S. OR ABROAD ON RECEIPT OF CHECK OR MONEY ORDER

PERFECT ARRIVAL GUARANTEED!

Minimum 3 Cartons • Include Postage and Insurance as follows: Within 150 Miles • For 3 Cartons 15¢ • Add 1¢ for each additional carton • Distant Orders Require Extra Postage.

WE CARRY A COMPLETE LINE OF POPULAR BRANDS OF CIGARS—Write for Price List
Prices subject to change without notice

OUR 28th YR. • 100,000 SATISFIED CUSTOMERS

SILVER ROD SALES
DEPT. A, JERSEY CITY 6, N. J.

Amazing! $25 Is Yours!

• For selling only 50 boxes greeting cards. Sells for $1—your profit to 50c. Also Easter and gift cards, stationery and wrappings. Costs nothing to try. Write for samples on approval.

MERIT, 70 William Street, Dept. PS, Newark 2, N. J.

AMAZING MYSTERY BUTTON

Startles Everybody. With this *Electronic Button* you can make your own Telephone-Amplifier-Dectectiphone. Attach this button to piece of cardboard—transmit conversation to another room. Music also transmitted to distant places. Most interesting electrical apparatus ever discovered. Enables you to perform hundreds of experiments. So tiny it can be concealed in dozens of places. A Pre-War Product. Electronic Button including 5000 word instruction booklet with 50 illustrated experiments, postpaid, only **$1.00**

ELECTRONIC PRODUCTS COMPANY, SAINT CHARLES 2, ILL.

Power Racing Sensation Race it With Class A or B Engine and MINI-MOUNT Transmission Unit

THIMBLE DROME POWER RACER

Real scale model of the classiest midget racer you ever laid eyes on. Die cast aluminum body, aluminum rubber-tired wheels. Chrome exhaust stacks. Wobble Pump. Instrument Panel. Car is 9⅜" long, 4" high. Weighs 18 oz. $4.25 postpaid. Mini-Mount transmission unit, die cast frame, ball bearing, for all class A, most class B engines, complete $9.45. Less gears $4.95. Unit with ring gear $7.45. Pinion Gear $2.00. Rush order for postpaid delivery. $1.00 deposit for C.O.D.

HOME SHOP PRODUCTS CO., Dept. 23, 4821 Sheridan Road, Chicago

DON'T WALK . . .

"Aero-Hop"

FOR FUN! FOR HEALTH! FOR SKILL!

Hollywood's Newest, Fun & Sport Sensation!

The Jumpingest, Bouncingest, Flyingest Little Machine since the Aero-Plane. Different from any other Jumping Stick. Really has performance: Broad Jump up to 11 feet . . . High Jump over 3 feet. Aero-Hop Rope, etc., etc. Highest Aircraft Quality Materials. Special Springs are from 27" to 40" long. Fun & Sizes for Everyone Junior (under 80 lbs.) $6.45. Teen-Age (80 to 125 lbs.) $6.95. Senior (over 125 lbs.) $7.45. From your Dealer or Send Check or Money Order. Shipped Postpaid in U. S. A.

SEND FOR FREE CIRCULAR

Dealers, Jobbers and Salesmen Wanted

FRANTZ INDUSTRIES
Dept. S
1701 West Slauson Ave., Los Angeles 44, California

RIDE TO WORK

Tired of waiting for streetcars, buses? Be your own transportation boss with a WHIZZER Motor on your bike. You'll go 125 miles and more on a gallon of gas—that's six miles for just one cent! Speeds up to 35 miles per hour . . . 2½ sturdy horsepower. Backed by eight years of progressive engineering. Fits any man's balloon tire bike.

FOR JUST ONE CENT

RIDE ONE AND YOU'LL BUY ONE!

ONLY $97.55 PLUS TAX

*FOB Pontiac, Mich.

ON A

WHIZZER

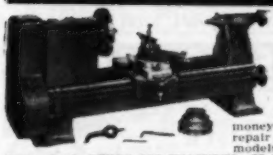
Whizzer Motor Company, Dept. 533, Pontiac, Michigan.

I enclose $99.97, which includes $2.42 Federal Excise Tax ( ) check or ( ) money order. Send me one WHIZZER Motor complete, ready for installation. If descriptive literature only is desired, check here ( ).

Name_____ City_____

Street_____ State_____

Everyone Can Afford This LATHE!



• For Farms, Home Work Shops, Model Builders, Hobbyists

There's hardly a hobbyist, workman, farmer or tinker who can't buy this metal turning lathe! Use it to earn money: develop inventions; make repair parts; do machine work on models. Has V-Way Bed, automatic power feed: OTHER BIG FEATURES. 8" Swing; 10" between centers; ½" hole through spindle; 22" bed. Weighs 72 lb. Guaranteed. Price complete, except motor, f.o.b. Lansing **$45**

SEND FOR FREE LITERATURE!

Rosemoor Mfg. Co. 2604 Bernice Rd. Lansing, Illinois

Build YOUR OWN BOAT

Complete parts cut to exact size—ready to assemble. Marine waterproof plywood, hardwood frame; rustproof oarlocks. Ideal for car top carry. Also models with laminated airplane spruce frames; mahogany decked outboard motor, high speed runabouts. Build now for personal use or sale at attractive profit. Exclusive franchise to local builders. Send 10 cents (one dime) for illustrated literature today.

$39.50 and up

704 Washington Ave.

OZARKA WOODSTOCK, ILL.

SUPER-MITE PACKS POWER!

NEW 1948 MODEL! IMPROVED CIRCUIT!

$4.99

• • SUPER-MITE FEATURES • •

- WORLD'S MOST POWERFUL MINIATURE RADIO
- USES WAR-BORN MINIATURE ELECTRON TUBES
- COVERS BROADCAST BAND
- 2,000 MILE RANGE
- MIDGET VARIABLE CONDENSER TUNING
- MIDGET VOLUME CONTROL
- CLEAR AS A BELL TONE
- POWERED BY NEW MIDGET BATTERIES
- PICTURE DIAGRAM FOR RADIO BEGINNERS
- EASILY WIRED BY ANYONE
- NO EXPERIENCE NEEDED

New Super-Mite 1948 Model is really a honey! Super-Mite is not a toy or gadget but is a very practical Miniature Radio! Super-Mite was designed for the Radio Minded both young and old and especially for those who delight in an Ultra Tiny Radio. Perfect for classes in Radio Science. . . . Perfect for the Radio Beginner who desires something better than weak crystal and poorly designed, complicated, One and two tube sets usually offered.

Super-Mite for 1948 with new greatly improved circuit includes a brilliant red crackle finish chassis, silver and black dial, streamlined bakelite control knobs, amphenol sockets, midget variable condenser, midget volume control, midget condensers and resistors, polystyrene coil, and all parts precision finished. Complete Set (less tubes) Only $4.99 postpaid. Midget electron tubes 95c ea. Sent C.O.D. for $1.00 deposit.

ELECTRONIC RESEARCH (Dept. P-S1) 1216 Park Row Bldg. New York City 7

BIG MONEY IN TELEVISION

BUILD TELEVISION SETS for PLEASURE and PROFIT!

Learn television by **building your own television set** with the famous **TRANSVISION Television Kit.** Big future in this growing field.

TRANSVISION KITS save you upward of 50%. **Large 12" tube Kit costs you only $289.50;** gives larger image, better sight and sound reception than many sets selling at $500.00. **Each Kit is COMPLETE** with all tubes, pre-tuned R.F. Unit, antenna, wire, solder, and instructions.

EASY TO ASSEMBLE. No technical knowledge required. Clear step-by-step instruction manual guides you to successful assembly in 24 hours. **TRANSVISION** "Service Notes" gives you priceless education in television.

FLASH! Brand new 15" tube Kits now available. Also 7", 10" and 12" tube Kits. **Tremendous savings.** All Kits backed by factory guarantee. Write today for further details to **Dept. P.S.**

SEND FOR FREE CATALOG

BEACON TELEVISION, INC.
785 THIRD AVENUE NEW YORK 17, N. Y.

POWERBIKE

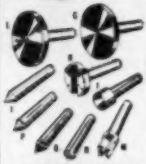
gets you there safely and economically

The motor is in the rear, mounted low to aid balance and handling. No grease to rub off on your legs, no hot fumes blowing in your face. 100 miles per gallon, 30 MPH. 1½ HP fan cooled engine, kick starter, automatic clutch, fits any man's or woman's balloon-tire bike. See your dealer or write direct.
TERRITORIES AVAILABLE.

SAGINAW PRODUCTS CORP. • SAGINAW, MICHIGAN

SOUTH BEND

LATHE CENTERS and DRILL PADS



Description	No. 2 Taper	No. 3 Taper
L—SCREW CENTER	$3.00	$3.25
G—DRILL PAD	2.50	2.75
H—CROTCH CENTER	2.50	3.25
J—HOLLOW CENTER, 60°	2.00	2.75
I—60° CENTER	2.25	3.00
P—CARBIDE TIPPED CENTER	4.50	8.00
Q—HALF CENTER	2.25	3.00
N—CUP CENTER	2.00	2.75
M—SPUR CENTER	3.00	3.25

SOUTH BEND LATHE WORKS 456A E. Madison St. South Bend 22, Ind.

WANTED PRACTICAL RADIOMEN

Your FCC license is the next Step Up!

Better radio jobs require FCC license. We train and coach you to get it, but you must have some practical experience or be graduate of basic home study or resident radio course. Send outline of your radio experience to get Free Book, "How to Pass FCC License Exams."

CLEVE. INSTITUTE RADIO-ELECTRONICS
PS-3, 513 Terminal Tower Cleveland 13, Ohio

LEARN **GUITAR** at Home $1.00

Most modern, complete and thoroughly illustrated method available. No previous musical education necessary—Explains everything in easily understood language. Specify Spanish or Hawaiian.

Send One Dollar to RITE NOTE
342-AN. HawthorneBlvd., Hawthorne, Calif.

DRAINS CELLARS, WASH TRAYS CIRCULATES OIL

1800 GPH 300 gal. 30′ high, use ⅛ to ⅓ HP motor. Will not clog. $6.50

Postpaid if cash with order.
(Add 50c for west of the Mississippi.)

Thousands in use since 1936

LABAWCO PUMPS, BELLE MEAD 3, N. J.

EYE GLASSES BY MAIL

FREE ...of extra charge: Eye Glass Case, Wiper, Eye Glass Cleaner with Each Order!

• **30-DAY TRIAL OFFER**

NEWEST STYLES. Write today for **FREE** Catalog. Full Information, Low Prices, Scientific Sight Test Chart!

SEND NO MONEY — POSITIVE MONEY-BACK GUARANTEE

LOW AS $1.95 AND UP

LEE EYE GLASSES CO.
4148 Easton, Dept. Q-5, St. Louis 13, Missouri

"PLASTICS"

Work in a fascinating and profitable hobby. Just out—our latest fabricating manual. Tells you how to work with Plastics. Our new Catalogue provides all needed materials: Plexiglas—Lucite—Tenite—Catalin—Acetate—all in sheets, rods, and tubes. Complete line of cements, dyes, accessories and supplies. Send 20¢ today for Catalogue and Handbook. We apply this amount on initial order.

HOUSE OF PLASTICS
8848 Linwood Avenue, M. O. Dept., Detroit 6, Michigan

HANDY TOOL

reconditions battered threads and makes quick repairs without dies. Repairs ¼", 5/16", ⅜", 7/16", ½", ⅝", and ¾" threads.

SPECIFY U.S.S. or S.A.E.

SATISFACTION GUARANTEED

ADVANCE SUPPLY CO.
3243 Joy Road, Detroit 6, Michigan

MAKE UP TO $5.00 AN HOUR In Your Own YEAR 'ROUND Business!

ONLY A FEW DOLLARS PUTS YOU IN BUSINESS!

Many Clearing as High as $20 to $30 a Day *NET* Renewing Rugs, Carpets, Upholstery. New Method Now Used for Auto Upholstery. Write for Facts About Quick, Easy Way to Get Started

Here is the chance you've been looking for to step into a pleasant, dignified, big-pay business of your own that offers you a steady, year 'round income. Start on "a shoe-string," full or spare time, right from your own home. Equal opportunities for men and women, young or old, in small towns or big cities. **No experience needed.** Many making big money with new Americlean System just cleaning auto upholstery. **Easy to learn.** We send you complete instructions and quick-cleaning supplies so you can start making money the very first day! Quick method cleans upholstery, rugs and carpets like new without taking off floor! Tremendous demand in homes, apartments, hotels, stores, office and public buildings. **Steady repeat business.** Territories going fast. Write today for full **FREE** facts. No cost or obligation. Rush letter or postcard now to

AMERICLEAN CO., Inc.
Dept. H-15, 211 North 7 St., St. Louis 1, Mo.

WRITE FOR FREE DETAILS NOW!

Jiffy Jr. ELECTRIC HEATER

BOILING HOT WATER IN A JIFFY!!

Only $2.95 HOT WATER IN A JIFFY

plus twenty five cents for postage

Place the *Jiffy* Electric Water Heater into the water and insert the plug in the nearest electric wall or light plug. You will have hot water in less than five minutes for baby's bath, your washing, shaving and a great many other uses in the home, camping, business, and on the farm. Mailed complete, including six feet of rubber covered wires and plug. One year guarantee. **JIFFY ELECTRIC COMPANY, Dept. W-1, 2132 Stephenson Highway, Hazel Park, Mich.**

Grow your own MUSHROOMS in your own HOME

MAGIC MUSHROOM TRAYS

Enjoy the thrill of picking fresh, delicious mushrooms at home. Keep your table supplied for months. The Magic Trays are completely developed with spawn. Simply place trays in basement, keep soil damp, mushrooms appear in two or three weeks. Each tray produces for two to four months. Simple instructions with each order. Magic Mushroom Trays are prepared by mushroom growers with years of experience, the same way as those used for commercial production. Trays are 14 x 18 inches. Shipping weight 25 lbs. Orders accepted all states—except West Coast and deep South. **Mail** order now. Enclose check or money order. 4 for $5.00—10 for $10. Trays sent Motor Express or Railway Express.

HORLOCHER MUSHROOM FARMS
ASHTABULA, OHIO

WAR SURPLUS LENSES

All-Purpose ELBOW

TELESCOPE

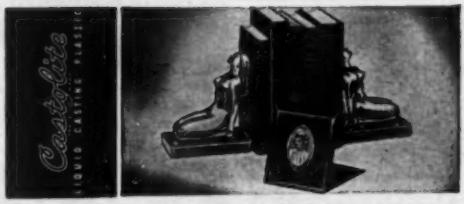
$6.95 3-power, field view 13 degrees, 20 minutes. Achromatic, color-corrected. Can be converted by shopmen to a "center-scope" for drill press, jig and tool work. Lens suitable for photography and microscopes. Gov't cost approx. $150.

3X GUN SIGHT

Precision optical instrument; powerful achromatic color corrected lens; waterproof, dustproof, shockproof. All bronze and brass body; a find for bird and nature study. Govt. cost approx. $175.00. Each . . . **$4.95**

SURPLUS DISTRIBUTORS
924B N. Plankinton Ave.
Milwaukee 3, Wisconsin

F.O.B. Milwaukee. Send money order or check. C.O.D. orders, 20% deposit, balance plus postage on arrival.



NEW LIQUID PLASTIC

MAKES SWELL GIFTS, NOVELTIES, THINGS TO SELL!

Thousands are having fun, making big extra money, using CASTOLITE, the wonder Liquid Plastic that pours without heat or pressure. Use crystal clear or with brilliant colors. Embed real flowers, butterflies, coins, medals, photos, for plaques, paper weights, novelties. Make useful objects like book ends, trays, picture frames, coasters, jewelry, toys. Also make gears, parts, models. Can be sawed, carved, drilled, turned.

20-PROJECT KIT $3.50

(West Coast, Canada, Mexico $3.75)

Special Casto-Kit now ready. Contains materials and instructions to make useful objects at once. Get into this fascinating new field now, and have unusual distinctive gifts or make fine sales. Send $3.50 (West Coast, Canada and Mexico, $3.75) for your Casto-Kit, postpaid. Or order C.O.D. No overseas shipments. For instruction manual alone, send 25c. **The Castolite Company, Dept. C-2, Box 211, Kenilworth, Ill.**

The plastic with 1001 uses. DEALERS—Write for literature and prices.

35MM FILM FOR LEICA, KODAK, RETINA

and other similar cameras available in

ANSCO Ansco Super-Pan Supreme, Ansco Ultra Speed & Ansco Fino-Pan

KODAK Kodak Plus X, Kodak Super XX & Kodak Background X

DUPONT DuPont Supreme #2 & DuPont Supreme #3

ONLY $1.40 per 100 ft. ROLLS

each roll of film contains 18 strips of 36 exposures each —properly notched.

SUPPLIED ON REELS IN METAL CANS
GUARANTEED IMMEDIATE DELIVERY

Send $1.40 for each 100 ft. roll and we will ship your film immediately. We pay postage.

Eight-Sixteen Films, Inc., 630 Ninth Ave. N. Y. 9, N. Y.

★ ★ ★ ART STUDENTS

SHOW YOUR OWN MOVIES AT HOME OF BEAUTIFUL HOLLYWOOD MODELS

Films Suitable for Study of Effective Lighting & Composition.

50' 8mm. $1.25	100' 16mm.....$5.00
200' 8mm.....$5.00	400' 16mm...$10.00

Send No Money—Pay Postman—We Ship C.O.D.

Eight-Sixteen Films Inc., 630 Ninth Ave. N. Y. 19, N. Y.

WAR SURPLUS
AND HUNDREDS OF OTHER BARGAINS

HAND MICROPHONE
Top quality hand microphone with control button in handle. Highly sensitive. Has rubber covered cord and tel. plug. Fine for use on home recorders, public address systems, etc. Brand new—perfect. Shp. wgt. 2 lbs. Stock No. 170. Each **$1.95**

MESS KITS
Regulation two-piece Army Mess Kits with folding handle. Used, but perfect. Weight 2 lbs. No. A116—Ea. **69c**

CANTEENS
Reg. U. S. issue canteens. Plastic screw top chained to body. Slightly used but perfect. Wgt. 1 lb.
117—Metal
116—Plastic—Ea. **69c**

CANTEEN CUPS
All metal. Folding handle. Wgt. 1 lb. No. A120—Each ..... .25c

CANTEEN COVERS
Heavy canvas. Button fastener.
New No. 530—Each 69c
Used No. 119—Each 35c

Heavy Duty Rubber Gloves
Brand New
Extra heavy—extra long. Brand new, high quality gum rubber for softness and ease in use. Designed for heavy duty industrial service — protection in handling chemicals, acids, etc. A real bargain at this low price. Stock No. 295— Per Pair, Only **79c**

Shatterproof Goggles
All purpose type. Sponge rubber frame. Red shatterproof flexible lens. Adj. head band. With case. New.
Wgt. 1 lb.
No. 139—Each **39c**

STOP WATCH
Genuine Elgin 15 Jewel movement. Ideal for split second timing in racing, sports, time study, etc. Full sweep split second hand graduated in 1/10th seconds. Stem wind, start, stop and reset. Used but guaranteed perfect. A splendid value. Shp. wgt. 1 lb.
No. 200—Each **$9.95**

POPULAR RECORD ASSORTMENT
Fifty records of modern dance, race, blues and hillbilly selections. No two alike. Famous name bands and artists included. Used in juke boxes, but guar. perfect. Shipped exp. collect only—no exchanges or refunds. Wgt. 28 lbs.
No. A303—50 records **$9.64**

No. A300—25 Records. All Dance. Wgt. 14 lbs. **$4.88**

No. A301 — 25 Records. Hillbilly, Race and Blues. Wgt. 14 lbs. Set.. **$4.88**

No. 302—25 Records. All Hillbilly numbers. Wgt. 14 lbs. Set.. **$4.88**

FLEX. NECK FLASHLIGHT
Ideal trouble shooter's flashlight. Flexible neck lets you direct light around corners and inaccessible spots. Brand new! Plastic case with BX type neck. Uses 2 standard flashlight batteries. (Less batteries) Shp. wgt. 2 lbs.
No. 205 Each **$1.39**

RADIO HEAD-PHONES
Extremely sensitive with 4000 ohms resistance. Brand new and fully guaranteed. With moisture-proof cord and phone plug. A splendid value for the radio serviceman and experimenter.
A106—PAIR **$2.95**
New supersensitive phones.
A108—Pair **$5.95**

Plastic 8 oz. Flask
For hunters, scouts, fishermen. Waterproof and transparent. Use it for liquids. Use it for matches, flies, bait, etc. Has screw cap top for liquids, plus full open top. Size 5½ x 4½ x 1½ ins. Has hundreds of other uses. Wgt. 1 lb.
No. A347. Each **29c**

7 LB. EXPERIMENTER PARTS ASSORT. KIT
A "gold mine" for the radio serviceman. Hundreds of valuable radio parts, new radar and electronic parts and subassemblies, coils, resistors, trimming condensers—worth many times this low price. A130R—7 lbs.... **$1.79**

PUP TENTS
Regulation Army Pup Tents of durable, brown canvas. Used, but in good condition. Fine for campers, outdoorsmen, Boy Scouts, etc. Wgt. 8 lbs. A100—Tent only.... **$3.95**
A110—Tent, new $7.95
A101—Ropes, wooden poles and stakes for above. Per set..... $1.00

27 LENSES, ALL NEW, PERFECT.
For experimental work in optics. Consists of 27 precision ground and polished prisms and lens elements in assorted diameters and focal lengths. Big variety, positive, negatives, etc. Actual value over $100.00. A519—27 PIECES **$7.95**

ARMY TENTS
16x16 Ft.
A value you can't beat. Big 16x16 ft. pyramid tent with 4 foot drop wall. Used but in excellent condition. Poles not included. Fine for camping out, carnivals, etc. Worth twice this money. Shp. wgt. 100 lbs. Stock No. $21—Each only.... **$35.00**

STIRRUP PUMP
Works with any pail or bucket. Shoots a high pressure stream up to 30 feet. Use it for spraying garden and trees, for whitewashing, fire fighting, drainage, etc. Complete with 10 foot flexible hose. All brand new. Regular $3.80 value. No. 344— Each..... **$1.49**

FISHING REEL
Exceptional quality for this low price. Has rugged one piece frame. Ratchet drag. Single action. Attractive catalin handles. Brass bearings for smooth operation. Full 100 yard line capacity. Brand new! A splendid value at this low price. No. F412, Each.. **98c**

BAYONET BLADE
Fine forged steel. Ground but not polished. May be made into throwing or hunting knife or spear. Blade 6¾x¾ inches. 11¾ inches overall. Will take and hold a fine edge. Shp. wgt. 1 lb.
No. 664-R—Each..... **49c**

VEEDER - ROOT COUNTERS
Three wheel type—counts to 999 and repeats. Geared shaft end may be replaced with a pulley to regulate counting speed. Has hundreds of uses. All brand new. A splendid value. Shipping weight 1 lb. No. 241. Each..... **98c**

Officers Watch Compass
Brand new gov't. surplus. Army-Navy model. Single jewel mounted needle. Silver colored dial. A splendid value. Shp. wgt. 1 lb.
A174—Each.... **98c**

McCLELLAN SADDLE
Brand new! Top grade cowhide, 12 inch seat. Hair girth. Has straps for blanket roll and knapsack. Gun boot and sabre loops. A real buy for any horseman. Worth much more. Shipping weight 15 lbs. Stock No. A145.
Each..... **$16.95**

WOOL SLEEPING BAG
G.I. type 100% wool with 30 inch Talon zipper. Used but renovated for reissue.
Shp. wgt. 3 lbs. No. 165. Each **$3.95**

AMMUNITION BOX
Used for 50mm ammunition. Heavy, all metal design with latching top and folding handle. Provides safe, fireproof storage for valuables, etc. Measures 12x6x7½ inches. Used but in new condition. Shp. Wgt. 8 lbs. No. 338—Each **79c**

RUBBER SUIT
Fits over your regular clothes and shoes. Can be cut apart for waist high waders, hip high or knee high boots, also arm length rubber gloves. Heavy gum rubber over fabric. Fine for those who work in the water, commercial fishermen, sewer diggers, etc. All brand new! Wgt. 14 lbs. No. 183 —Each..... **$4.95**

Please add 15c for postage.

LIFE PRESERVER BELTS
Right from the invasion beaches. Consists of two air chambers. May be inflated automatically with "sparklet" cartridges or manually by attached hose. Adjustable in waist size. One air chamber guaranteed air tight—other may need a tire patch. All belts are used and slightly soiled but a bargain at this low price.
No. 1261—Each..... **$1.00**

SPARKLET CARTRIDGES
May be used with above belts. In boxes of 10. Stock No. 284. Per Box..... **50c**

ORDER DIRECT FROM THIS AD
Values galore! Hundreds of hard-to-find items for home, shop and outdoors. Make remittances by money-order, bank draft or personal check. Send 25% deposit on C.O.D. orders. No C.O.D.'s on orders for less than $5.00. Include sufficient postage on parcel-post orders—any overage will be promptly refunded. All quotations F.O.B. Chicago. Used items and materials are guaranteed serviceable and as described. Your money back if not more than satisfied.

Big Illustrated Catalog Free
WRITE FOR YOUR COPY TODAY

STARK'S
Dept. PS3
509 S. State St.
CHICAGO 5, ILL.

WILLARD 1½ VOLT STORAGE BATTERY
A rechargeable, wet plate battery good for years of service. Brand new. Battery is shipped dry but fully charged — any battery station will add acid. Use singly or in multiples for radio sets, bell circuits, alarm systems, etc. Measures 5¼x4x3 inches. Ball floats indicate proper level for filling. Shp. wgt. 4 lbs. Stock No. 297 — Each Only..... **$2.95**

Classified Ads only 70c per word per insertion, payable in advance. Minimum ad 10 words. To be included in May issue, copy should be in our office by March 26th. May issue on sale May 1st.
POPULAR SCIENCE MONTHLY—351 FOURTH AVE.—NEW YORK CITY 10

12 AUTOMOBILES

RACING Car Equipment for all cars. Engines. Racing Heads. Manifolds. Carburetors. Mufflers. etc. Speed instructions and literature $1.00—refunded first order. Lee Motorcraft Co., 1412-B Great Northern Bldg., Chicago 4, Ill.

BRITISH Motor Industry. A review 1896 to 1946. 176 photographs, charts, drawings. Names, addresses all British manufacturers. Contains everything pertaining to British auto industry. Old and new cars shown. 52 large pages. $1.50 postpaid. Clymer, Dept. B-BM, 2125 W. Pico, Los Angeles 6, Calif.

PROTECT automobile tires against flats. Avoid accidents. Save lives. The Tiresignal does it. Every automobile needs them. Five for $2.00. Tiresignal, Dept. B, P. O. Box 1667, Los Angeles 28, California.

AUTO Racing magazine subscriptions. Pacific Speedway News. $6.00 yearly. National Speed Sport. $4.00. Illustrated Speedway News. $4.00. All give complete data midget, big car race results. Sample copy each 50c. Specify Publication wanted. Clymer, Dept. B-32, 2125 W. Pico, Los Angeles 6, Calif.

AUTOMOBILE Racing Book. Fifth Edition—Revised. Tells how to build dirt tracks bodies, frames, engines. Records, superchargers, rules, formulas, plans, stock conversions, roadster racing, fast Fords. $1.00 postpaid; $1.15 C.O.D. Ray Kuns, Department 274, Madisonville, Cincinnati, Ohio.

REX MAYS Racer $3.00. Kun's Auto Racing Book 6th edition just out $2.00 postpaid. Clymer, Dept. B-39, 2125 W. Pico, Los Angeles 6, Calif.

AUTOMOBILE Racing. Sixth Edition. 100 illustrations. Working drawings with building instructions for Ford-60 midget, California roadster, Offenhauser racer. Details on racer parts. Sample entrance blank. World's record 158.5 M.P.H. rear engine four-wheel drive car. Interesting information for fans, drivers, mechanics. $2.00 postpaid; $2.25 C.O.D. Ray Kuns, Department 62, Cincinnati 27, Ohio.

NO. 4 Clymer Historical Scrapbook. Entirely new, different. 224 pages, advertisements, photographs 250 early automobiles, motorcycles. $1.50. DeLuxe edition $2.50 postpaid. Clymer, Dept. B-38, 2125 W. Pico, Los Angeles 6, Calif.

NEW Streamlined motorbikes. Send twenty cents for photo. Thomas Fisher, Antigo, Wisconsin.

BRITISH Cars. New, unique book illustrates, describes 34 British postwar cars, all makes, models, 67 beautiful photographs. A real catalog. Just out. $2.00. DeLuxe edition $3.00 postpaid. Clymer, Dept. B-PW, 2125 W. Pico, Los Angeles 6, Calif.

DUALTONE Crystalline packed, California mufflers, single or twin for all automobiles. Carburetor Velocity Stacks. Compression cylinder heads. Dual manifolds. Large double or single chromed tailpipe extensions. Chromed Station Wagon Stacks. Fender Skirts. Request Catalogue. Dualtone Mufflers, 2636B India Street, San Diego 1, Calif.

DUESENBERG Catalog reprint. Complete data. 32 photographs various body styles, views. Complete engine specifications, includes supercharger information. $1.00 postpaid. Clymer, Dept. B-36, 2125 W. Pico, Los Angeles 6, Calif.

IMAGINE. 250 miles per gallon your car now. Literature 25c. Jet Engine Co., St. Augustine, Fla.

RACING Car Builder Book. 22 drawings. Racing rules. Contains information on cams, compression, balance, midgets, big cars, roadsters, V-8 speed data. $2.00 postpaid. Clymer, Dept. B-RB, 2125 W. Pico, Los Angeles 6, Calif.

BUILD speedy midget track racer from castoff parts! Plans, specifications, construction information. $1.00. Motor Supply, Box CS-1682, Toledo, Ohio.

1947 INDIANAPOLIS Race History. Enlarged, 56 pages, 125 photographs, charts, complete details, cars, drivers, specifications. $1.00 postpaid. 320-page Indianapolis history book 1909 to now $3.50. DeLuxe edition $5.00 postpaid. Clymer, Dept. B-30, 2125 W. Pico, Los Angeles 6, Calif.

REX MAYS Racer $3.00. Kun's Auto Racing Book 6th edition just out $2.00 postpaid. Clymer, Dept. B-19, 2125 W. Pico, Los Angeles 6, Calif.

USED-CAR Buyer's Handbook. Save dollars, grief. Photographs, dealers' tricks, complete tests. $1 pp. Post Publications, Box 723-TC, Arcadia, California.

CLYMERTONE. Twin muffler sets, beautiful sound, complete with necessary welded pipes. E-Z installation. Ford V-8 $20.00. Chevrolet set with split manifolds, $37.50. Specify car model. Clymer, Dept. B-34, 2125 W. Pico, Los Angeles 6, Calif.

CUSTOMIZE Your automobile! Revised, enlarged book, latest restyling, complete, sharp. 50 photographs! $1 pp. Post Publications, Box 723-SC, Arcadia, California.

KAISER-FRAZER. Floyd Clymer's new book (no connection with Kaiser) gives uncensored, impartial report 3000-mile test including Pike's Peak, Kansas City-Denver record runs, economy test. Part by part equipment analysis. Good, bad comments, no punches pulled. $1.50 postpaid. Clymer, Dept. B-31, 2125 W. Pico, Los Angeles 6, Calif.

MAKE Your Model "A" do 100 mph. Lightning acceleration, breath-taking top speed. Complete details. Photographs. $1 Postpaid. Four Barrel, Box L-2, Eaglerock, Los Angeles 41, Calif.

HIGH Compression heads. V-8. More speed, acceleration, power. Offenhauser or Edlebrock $75.00 complete set. Dual manifolds complete with throttle kit, fuel lines. Edlebrock $49.00. Offenhauser $55.00. Give make, model V-8. Catalog 10c. Clymer, Dept. B-33, 2125 W. Pico, Los Angeles 6, Calif.

BUILD automatic clutch, scooters, midget autos, tractors, shop machines. Catalog Free. Nichols Equipment Co., Dept. 812, Purvis, Miss.

AUTO Racing magazine subscriptions. Pacific Speedway News. $6.00 yearly. National Speed Sport. $4.00. Illustrated Speedway News. $4.00. All give complete data midget, big car race results. Sample copy each 50c. Specify publication wanted. Clymer, Dept. B-22, 2125 W. Pico, Los Angeles 6, Calif.

CUSTOM-Car Photograph Album. Fascinating automobile style classics! Coachcraft, Summers, independents, photo-packed! $1 pp. Post Publications, Box 723-AC, Arcadia, California.

INSTALL V-8 engine in your Model A for extreme acceleration, more top speed, smoother performance. Complete details, photographs. $1 Postpaid. A-V-8, Box L-2, Eaglerock, Los Angeles 41, Calif.

RACE Driver History. Complete information every driver competing Indianapolis "500" 1911 to present. 313 drivers performance records every year alphabetically arranged. $1.50 postpaid. Clymer, Dept. B-RD, 2125 W. Pico, Los Angeles 6, Calif.

GREATLY Increase gas mileage! Latest copyrighted, "Economy Tuneup," tells how. No gadgets. Proven, simple facts. $100. Huff Industries, 10230 San Carlos, South Gate, Calif.

MAKE your Ford fast! Complete details, photographs. How to construct 120 mph Hotrod. $1 postpaid. California Bill, Box L-2, Eaglerock, Los Angeles 41, Calif.

BRITISH Sport cars. New book, 96 makes described. Fine illustrations, specifications. $2.00. DeLuxe edition $3.00 postpaid. Clymer, Dept. B-37, 2125 W. Pico, Los Angeles 6, Calif.

DRIVE a new King Midget, world's lowest priced automobile. We supply all parts ready to bolt together. 45 miles per hour, 90 miles per gallon. Beautiful racer-roadster body. Full accessories, including ski adapters for snow and ice. 24-page assembly book, drawings, photos, blueprints, plus detailed illustrated circular $1.00 (refunded first order). Circular only—25c. Midget Motors Manufacturing, Athens, Ohio.

AUTO Repair manuals, by Victor Page. Complete non-Technical data all mechanical features, operation, repair. Ford V-8 cars, trucks, 823 pages, 369 illustrations. $3.50 postpaid. Chevrolet six and truck, 896 pages, 363 illustrations, $3.50 postpaid. Clymer, Dept. FC-2, 2125 W. Pico, Los Angeles 6, Calif.

HOTROD and fast car equipment. Heads, camshafts, dual manifolds, mufflers, etc. List 25c. Build up your V8 or Chevrolet for racing, hotrod, or hot stock-car. Specify which make. Instructions $1.00. Alden Motors, Oakland City, Ind.

SENSATIONAL hot rod and Midget action pictures; also still pictures of your favorite drivers. Send 10c for list. Don Mohr Studios, 3417 West Sixth Street, Los Angeles 5, Calif.

13 AUTO SUPPLIES & EQUIPMENT

AUTO parts. New or rebuilt. Prompt shipment. Write requirements. Save money, buy direct. Factory warehouse. Mechanics Auto Parts, 3807-PS North Ashland Ave., Chicago 13.

PLATING Outfits For Autoparts. Connect to a battery. No tanks used. Outfits furnished. Free particulars. Gunmetal Co., Ave. K, Decatur, Ill.

AUTO parts for all autos and trucks. Trans. motors, differentials, fenders, carburetors. Also Body Parts. Security Auto and Truck Parts, 1923-PS Grace, Chicago 13.

WELDING bodies, repairing fenders pays good profits. Easy with Hobart A.C. Welders. Catalog free. Write Hobart Welders, Box P-282, Troy, Ohio.

REPAIR dents and holes in auto bodies with Duro Plastic Metallic Auto Body Solder. Applied with putty knife. Pints $1.50, quarts $2.50 prepaid. Leonard Sales Company, Box 6412, Cleveland, Ohio.

FREE trial in your car; Order Gane air flow needle today. $1.50 postpaid; Ten day money back guarantee, if not satisfied. For all cars, trucks, tractors, state make of car, truck, tractor, Make of carburetor. Advanced Automotive Products, 563-4 Lake Road, Webster, N. Y.

"SPEED & Power Handbook"—Construct your own super-chargers, water injectors, compression heads, fuel saving devices! Get racing speed, acceleration, dynamic power increases from any automobile. Mileage tips. Speed secrets. Formulas. Ignition tuning. Hotrods. Carburetion tricks. Fuels. Including "Restyling Ideas"—streamlining, model revising. Customizing. Sport changes. Accessories. $1.98. Newhouse Industries, 5941-A Hereford, Los Angeles 22.

CARBURETOR repair kits, miscellaneous parts for most popular carburetors. Carburetor Service, 600 La Prairie, Ferndale 20, Mich.

FORD-Mercury owners 1941-1947, operate your dome lights from both front doors. $2.50 free literature. Danby Manufacturing Company Portland 4, Michigan.

SAVE Gas! Easier starting! "Lektron" spark intensifier. Easily installed. State make of car. $1.25 plus C.O.D. charges. Electronic Industries, Box 2733, Cleveland 11, Ohio.

MOTORISTS save gasoline by Vacu-mating overrich mixtures. Fits all cars. For free particulars write Vacumatic, Dept. 1312, Wauwatosa, Wis.

STEPHEN'S Cement, seals cracked car batteries. Can $1.00 Postpaid. Guaranteed. Batteryman, Grand Junction, Colorado.

CAR Trouble? Million new, used parts. Describe needs. Automotive, 2928 B, North Western, Chicago 18.

UNUSUAL Gov't. surplus item—Airplane lights. New. Ideal for boats, for path clearance, signalling. Excellent for road trucks, busses, construction night work. Has powerful beam, operates on 27 volts or 110 volts with transformer, complete with powerful motor to oscillate beam. A value of a lifetime! Two complete units to a set. Now! $19.50 set, three for $50.00. "Amazing Bachman's." 25 Herman Street, Rochester 5, New York.

VAPOR injection for cars. Faster getaway, improved climbing. Wartime development eliminates knock, carbon. Installs 10 minutes. $3.98 plus postage. Rad-ar Products, 140-27 169th St., Jamaica 5, N. Y. Dept. PS1.

AUTO parts—new or rebuilt—for all cars. Starters, generators, carburetors, clutch assemblies, transmission and differential gears. Everything you need. We have large stock—can ship fast. Write us. Grove Auto Supply, Dept. PS, 4854 Cottage Grove, Chicago, Ill.

PISTONS: Old & New Cars. Discounts. M. Merryman, Lawndale, Calif.

SEND $1.00 for four $1.00 cans atom-age auto-lube. Nassau Laboratories, Hackensack, N. J.

SENSATIONAL seat covers. Jobber's discounts. Mono, 6545 Santa Monica Blvd., Hollywood, Calif.

14 AUTO TRAILERS

BUILD your own Trailer! Save Money! Have every feature you want! Plans for House, Sport, Camp and Utility trailers. Catalog describing 9 models 10c. (15c in Canada and overseas). Jim Dandy, Box 125-B, Wausau, Wisconsin

TRAILERCOACHES — learn about all types—sports, living or travel. Approximately 100 pages monthly—magazine tells all. Special rate $1 the year in U.S., $1.50 to Canada, $2 Foreign. Trail-R-News, Box 431-C, Glendale, California.

COMPLETE foundation for your trailer home. Chassis frames. Tor-Q-Les axle with springs, wheels, hitch, Parking jacks. Literature on request. General Trailer, 412 So. Barstow, Eau Claire, Wis.

TRAILER Plan booklet, house, sport, etc. with complete parts, accessory catalog, book Trailer Building—$1.00. Marine Mart, Buffalo 7A, N. Y.

91 MOTORCYCLES, BICYCLES, SUPPLIES

WHEELS! Build wagons, scooters, mowers, trailers, wheelbarrows, grocery carts, baby carts, play pens, baby carriages, 4" to 16". Free list. Trulsen Mfg. Co., 811 E. 31 Kansas City, Mo

LARGE stock Indian parts. Expert motor rebuilding. New and rebuilt Chief Motorcycle, motors only. Indian Motorcycle Sales, Kansas City 1, Mo.

CUSTOM Motorcycle accessories. Picture folder free! New seat covers, all colors, molded cushions, Chrome muffler-loudspeaker. Finest leather jackets; sidestand; seat springs, etc. Pacific Cycles, Dept. B-4, 1308 Pine, Seattle, Wash.

WHEELS, Tires, Tubes for Motor Scooters, Midget Cars, Wheelbarrows, and Industrial equipment. All sizes. Bicycle Parts, accessories. Largest stock in United States. Send dime for list. Cycle Transport Company, 1241 S. Michigan Ave., Dept. C, Chicago 5, Illinois.

MIDGET racer $40. Cushman motorscooter $15, motorbike outfit $15. Harley-Davidson motorcycle $35. Send 25c for new catalog #12 listing amazing bargains in motorscooters, motorbikes, midget cars, motors parts. Gail, 538 Erie, Toledo, Ohio.

MIDGET automobile $15. Cushman motorscooter $20. Indian motorcycle $30 tires 50c. Send 25c for Spring catalog #940 listing sensational bargains in motorscooters, Servicycles, midget cars, used motors, parts. Associated, Box CS-1764, Toledo, Ohio.

T. T. RACING. New, exciting, accurate book of world famous English road racing history. Just printed. $3.00 postpaid. See our advertisements under autos. Clymer, Dept. TT-2, 2125 W. Pico, Los Angeles 6, Calif.

PROFESSIONAL Midget racer, motorscooter, midget roadster, midget motorcycle. Plans, specifications contained in illustrated handbook. 25c. Big list bargain priced used motors, motorscooters, Servicycles, etc., included free! Midwest, 3830 Drummond, Toledo, Ohio.

BUILD America's lowest priced motorscooter speedster! Complete plans, specifications $1.00. Big list bargain priced used motors, etc., included free! Motor Supply, Box 1682-CS, Toledo, Ohio.

350 AIRCOOLED Engines, war surplus, send dime. Donz, 1252 Thurman, Camden, New Jersey.

NOW Available! For All 1945-46-47 American Moto-Coots Bendix Lighting System Generator. Sealed beam headlight with Attachments. Give model when ordering. Genuine Moto-Scoot Parts Also in stock. American Moto-Scoot Co., 630 W. Lake St., Chicago 6, Ill.

MOTORSCOOTERS, motorbikes, motors. List 25c. Osborne Motors, Box 915, Winston-Salem, North Carolina.

FLAT Rate Repair Manual for Harley-Davidson. Gives flat rate charge for every operation. Every dealer, owner, mechanic needs this new book. $2.00 postpaid. Clymer, Dept. B-FR, 2125 W. Pico, Los Angeles 6, Calif.

MOTOR Scooters, bicycle engines. 120 miles gallon. Dime for catalog. Clymer, Dept. B-35, 2125 W. Pico, Los Angeles 6, Calif.

15 AVIATION

GIANT Kites. Only $20. Fraction government cost. 10x14 ft. Double tier. This monster tows cars, skiers, skaters, canoes. Lifts light persons, antennas, advertising, cameras. Pleasure, Profit. Great-Northern Mart, North Adams, Mass.

PROPELLERS—2 & 3 blade, for snow-ice sleds, boats. Catalog. Standard Aerocraft, Box 387, Ft. Worth, Texas.

WAR surplus releases—aerial cameras, $175.; Gun Cameras $30.; Elgin Stop Watches $7.50; Hamilton Navigation Watches $27.50. Sextants $12.50 (Free Folder). Pan American Navigation Service, Div. 3, 12021 Ventura Blvd., N. Hollywood, Calif.

49 ELECTRICAL SUPPLIES & EQUIPMENT

AMAZING Communication unit! Remote controlled to send messages house to barn, to shop, etc. Communicate with dad in garage or junior in attic. Contains two identical set-ups with buzzers, lights, remote control transformers and dial with codes. Operates on regular house current, ready to operate, simple to connect. Unlimited uses. Only $14.95; three sets for $40. "Amazing Bachman's," 25 Herman Street, Rochester 5, N. Y.

FREE Catalog—Motors, welders, welding supplies, generators, fencers, electric mowers, freezers, other electrical items. LeJay Company, Minneapolis, Minn.

FLUORESCENT lights. Make your own ideal for home and shop. Complete electrical parts for 20-watt fixture with detailed instructions. Postpaid only $2.00. Write Fluorokit, 332 E. Reservoir, Milwaukee, Wisconsin.

LAMPS—Build own originals, parts wholesale any amounts. Catalogue 10c. Brown Lamp Co., Box 501, Wellston, St. Louis 12, Mo.

LAMPS—All parts to build or repair. Catalog 10c. Gyro Lamps, 5416B Clark, Chicago 40

TEST Continuity with new pocket universal tester. Locates Electrical defects easily. Starco, 233 Canal, New York City.

SELSYN motors, $3\frac{1}{2}$ x $5\frac{1}{2}$ heavy duty, 115 volts, 60 cycles, $10.25 per pair. Weber, 150 Maple, Hershey, Pa.

ELECTRIC Pencil: Engraves all metals. $1.00 postpaid. Beyer Mfg., 229-C, Dixon, Uniontown, Penna.

LAMP sockets, mogul sockets, three way switches, tumbler switches, receptacles, cordsets, electrical repair parts, lamp parts, etc. Catalog 10c. Gearon Company, 6405H North Oakley, Chicago.

ELECTROPLATING Has a thousand and one uses when working with electrical supplies and equipment. Warner Electroplaters, permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free samples and literature. Warner Electric Co., Dept. ES-P3, 1512 Jarvis Avenue, Chicago 26, Ill.

GUNNERS Training Table—New—the greatest value offered yet. Ideal for clubs, shooting galleries, automatic checking, counting, burglar alarms. Can be operated as a very profitable business. Comes complete with 7 AC 110 volt motors, sensitive electric eye, powerful amplifier, rotating mechanism; maple top table, etc. All parts can be used individually. Worth the investment for parts and mechanism alone. Limited time—$300. "Amazing Bachman's," 25 Herman Street, Rochester 5, N. Y.

140 WELDING, SOLDERING

ELECTROPLATING Has a thousand and one uses. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free sample and literature. Warner Electric Co., Dept. WS-P3, 1512 Jarvis Avenue, Chicago 26, Ill.

SILICON Steel 30" strips, your width $12.00 cost. F.O.B. Ernest Noyes, 32328 Bush, Royal Oak, Mich.

A.C. ARC welders. Bench Sanders. Power mowers—Bargains. Holgerson Co., Canton, Kansas.

RUBYFLUID soldering flux, send $1.00, get one pint liquid and $\frac{1}{2}$-lb. paste flux with pamphlet "How to Solder." Ruby Chemical Corp., Columbus 8, Ohio.

"BUILD-Ur-Own" Portable arc welder. Save $300. Easy with Hobart Generator plus auto engine. Free instruction book. Write Hobart Welders, Box P-283, Troy, Ohio.

80 MACHINERY, TOOLS, SUPPLIES

DRILL GRINDER—Grinds drills to factory accuracy. Calipers with direct reading scales. Circle cutters. New Tool grinder. Lowest prices. Free literature. Factory, 811-A East 31st, Kansas City 3, Mo.

MODERATELY Priced. Available Now. Portable Electric Sander, Woodworking power tools, Shaper, Bandsaw, etc. Paint Sprayers. Armand Grinder for schools, home work-shops, cabinet-makers, farmers, garages, repair shops, others. Postcard brings free bulletin. H. Saltzman Co., 113-14 83rd Ave., Kew Gardens 15, N. Y. Dept. R.

WAR Surplus special: Big 50 lb. box popular size bolts, nuts, washers, screws, clamps, etc. $6.85. War Surplus Co., Box 910, New Brunswick, N. J.

MAKE Electric welder also pencil, information Free. "International", 6347 Parnell-S15-Chicago 31, Illinois.

FOUNDRY Castings, Blueprints. Materials for woodworking and metalworking machine tools. Suitable for commercial or home shop production. 23 items. Catalog 10c. Lewis Machine Tool Co., 3217 Union Pacific Avenue, Dept. S, Los Angeles 23, Calif.

CONCRETE Block machines $39.50 up. Catalog free. Concrete Mold Company, 5466 Gravois, St. Louis, Missouri.

CHUCKS, Independent, Universal, Threaded $1\frac{1}{2}$"-8 for South Bend, Atlas, Logan, Clausing, Craftsman Lathes. Also other chucks to 16". Top value. Free Literature. Westcott Chuck Co., 3700 Walnut, Oneida, N. Y.

TAPS, Dies and other tools direct by mail. Free catalog. King Tap & Tool Co. Inc., North Attleboro, Mass.

ELECTROPLATING Has a thousand and one uses when working with machinery, tools and supplies. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write Today for free sample and literature. Warner Electric Co., Dept. MTP-3, 1512 Jarvis Avenue, Chicago 26, Ill.

MECHANICS — Hobbyists — New — War Surplus bargains — Dual-Drive assembly, geared 7 to 1 reduction, driven by powerful 1/5 HP AC or DC motor, operates on 6-27—or 110 volts with transformer. Simple attachments, adapt this unit to countless uses. Used as individual drill, sander, etc. by detaching flexible drive shaft. Complete with stepdown transformer, worth half the investment—which can be used to convert nearly all aircraft motors to regular house current. $300. value! Special! $19.50. All Flexible Drive Cables, 10", 25" and 72"—Combination three sizes, $1.75. Precision-built Right Angle Drives, complete with flexible drive cables, $3.50. Magnet wire, $\frac{1}{2}$ lb coils No. 22, 10 rolls for $3.00 value—special $2.95. Aluminum and steel bushings and spacers, variety assortment, 5 lbs. minimum, $4.75. Rivet Assortment—copper, steel, aluminum, over 250 varieties—Extra special, 5 pound minimum $4.75. Micro Switches—6 variety assortment, only $4.75. Ranger Engine—new, in original case, 570 HP 12 cyl. V type. Engine Spec. No. 177. Complete with spark plugs. Original cost over $12,000 each. Special—$200. Crated weight 1200 lbs. Selsyns—New! Transformers—GE Model 2J1F1, 115-57.5V 400 cy. With gears—$1.50 each. Quantity lots, $15.00 dozen. Amplidyne Motor-Generators—GEGAM 31NJ9A. Output 60 VDC, input 27 VDC to 100 VAC, 485 watts. Sensational offer, $7.00 each, three for $20. Order today! No COD. "Amazing Bachman's," 25 Herman Street, Rochester 5, New York.

MILLER—$49.50 end mills—25c. Circular—10c. Machinery, Newfane 1, Vermont.

DRILL GRINDER for twist drills $2.95. See ad on page 260.

79 MACHINERY FOR SALE

ELECTRIC Motors, all sizes, also fan parts, build your own. Universal Fan Co., Peru, Indiana.

19 BOATS, OUTBOARD MOTORS, ETC.

FULL size, cut to shape boat patterns, blueprints, 7½—23 feet. Illustrated "Build a Boat" catalog, 10c (coin). "How to Build Boats" book, $1.00. Cleveland Boat Blueprint Co., Dept. A-77, Cleveland, Ohio.

PLYWOOD Rowboat and Motor Boat K.D. Kits. Assemble and save up to $57.50. Three popular models. Resin bonded, waterproof plywood construction. Easy to assemble in spare time. Write for free literature and complete specifications. C. R. Dillabaugh Boat Co., 7928 N. E. Mallory, Portland 11, Oregon.

INBOARD hulls, outboard runabouts, hydroplanes, hunting, fishing boats, boat kits, boat trailers. Huebl Boats, LeSueur, Minn.

ATTENTION sportsmen! Assemble Kayak from easy construction kit complete! Nothing additional needed! Play-acks, Dedham, Mass.

MARINE conversions for Ford and Jeep engines. Catalog 10c. Lehman Manufacturing Company, Department A, Newark 2, New Jersey.

AIRPLANE Jettison tanks—streamlined, 10½ foot, tear drop shaped, 165 gallon. Of light weight lead coated steel, weighs 75 pounds. Floats over 12,000 pounds. Ideal for making trim, inexpensive boats, canoes, kayaks, dinghys, duck boats, powered catamarans and runabouts. Prices $12.50, $9.75 each for three or more U. S. freight prepaid. General Sales, 205 Market, Grand Rapids 3, Michigan.

OUTBOARD motors—good values, used motors. Also used parts for most makes and models. Crandall-Hicks Co., 912 Commonwealth, Boston, Mass.

See display ad page 70; Boat Patterns and Kits. Marine Mart, Buffalo 7A, N. Y.

CANVAS, all widths. Airplane Windgope. Sails. Hardware, marine paints, large stock Marine supplies. Alan-Clarke, 96 Chambers, N. Y. 7, N. Y.

51 ENGINES, MOTORS, ETC.

WINDING Data, listing 225 motors, single and three phase, $1.00. Motor Data, Box 7631, Kansas City 3, Mo.

GAS drive arc welders. "Build Your Own." Portable, goes everywhere after profitable jobs. Free instruction book. Write Hobart Welders, Box P-284, Troy, Ohio.

MOTORS, generators; any H.P.—voltage; AC or DC; Rebuilt. Year guarantee. Roberts Electric, 7232 Madison, Forest Park, Illinois.

WELDING generator, 150 ampere $47.50. ½ horse 1725 RPM AC motor, $24.50. Butler, 1885 Milwaukee, Chicago, Ill.

MOTOR repair manuals, get our bulletins on stator winding tester, and A. C. motor winder. Motor Industries, Quincy, Illinois.

MOTORS! ½ HP DC converted to AC. All new. High Speed 110 volt, 25 or 60 cycle, single phase, ball bearing motors. Actual value about $75.00. Now $15.00 each or 3 for $40.00. Can be used in any position. Immediate Delivery! No COD. "Amazing Bachman's," 25 Herman St., Rochester 5, N. Y.

AMAZING toy electric motor. Fun to make. Parts and illustrated instructions, $1.00. D. Gikner, Mountain Ave., Mount Kisco, New York.

20 BODY-BUILDING COURSES

BAR-BELLS, Dumbbells, Exercise equipment, Courses, Free booklet. Good Barbell Co., Reading, Penna.

BARBELLS, Olympic types. Stamp for folders. Jackson Barbells, Springfield, N. J.

BARBELLS! 95 pound set $9.80; extra plates 9c pound. Send for free course and catalog. Bur Barbell Co., Lyndhurst, N. J.

124 SPORTING GOODS, GUNS, FISHING TACKLE, ARCHERY

SKI-TOWS. Portable. Auto-powered. 500 ft. long. Pulls you both ways. Up, level or downhill. Set up in 20 minutes. Only $125. Send card for particulars. Great-Northern Mart, North Adams, Mass.

START business yourself. Send for list of spinner blades, shafts, beads, rudders and parts for constructing lures that will catch fish. Spinner Specialties, Inc., Lewiston, Idaho.

SEND 10c for list 100 new and used guns. Frayseths, Wilmar, Minnesota.

5,000 BARGAINS, firearms, binoculars, war relics, catalog 40c. Smith Museum, Runnemede, N. J.

SHOTGUNS, Rifles, Revolvers. Over 500 Modern, Obsolete. Also Cartridges. List .10 coin. Ed Howe, 26 Main Street, Coopers Mills, Maine.

FREE! Klein's Sporting Goods famous "Trick Fisherman's Ruler!" Write for your free ruler today! Measures the "Fish that got away!" FLASH! Klein's big new 1948 "Fishing & Hunting Handbook" is hot off the press! Shows thousands of new and used guns, hunting, fishing and camping values. The handbook is only 25c (coin or stamps—refundable with your first order). Rush order for Trick Ruler (Free) and catalog (25c) in Klein's Sporting Goods, Dept. CTP-3, 227 W. Washington St., Chicago 6, Illinois.

CLOSING Out:—435 antique Firearms:—35,000 coins, relics, cartridges, swords, flintlocks, carbines, minerals, antiques.—Illustrated Catalog 25c. Heike, Wenona 2, Ill.

SHOOT From hip without aiming. Open front "Super Speed" holster for revolver, automatic. Send 3c for folder. Sterling Leather Products, Box 424-S, St. Joseph, Missouri.

55 FIELD GLASSES, TELESCOPES, ETC.

REFLECTING Telescope, complete 3½" diameter, equatorially mounted. View planets, stars, $19.75. Write Skyscope Co., 475 5th Ave., New York.

ASTRONOMICAL Telescopes, binoculars, microscopes; Bought, sold, repaired. Books. Lists 10c. Rasmussen-Reece, Amsterdam, N. Y.

POWERFUL astronomical Refracting telescope, equatorially mounted, all metal, two eyepieces, $16.50. Bluhm Optical Lab., 1270 E. 83rd, Cleveland 6, Ohio.

POWERFUL Astronomical telescopes easily made. Perfect lenses and instructions; 100 power $3.00, 100 and 200 power $4.00, 100, 200 and 400 power $6.00. Clear vision and full power guaranteed. Instructions alone 10c. Suffolk Science Service, Manorville, N. Y.

TELESCOPES, Binoculars, Microscopes.—big bargain catalog free. Brownscope Company, 24 West 45th Street, New York.

PORRO prisms for 6 x 30, 7 x 50 binoculars, 50c each. Ross, Section C, 68 West Broadway, New York, N. Y.

GOVERNMENT Surplus-telescopes, binoculars, lenses and prisms. Send 3c stamp for "Bargain" list G3. Hobbyist lens setmagnifiers, reducing lenses, positives, negatives, etc. 10 Piece set, $1.00. A. Jaegers, 123-26 Rockaway Boulevard, South Ozone Park 20, N. Y.

16 BABY CHICKS

BABY Chicks. Champion Mated. 25 varieties, 6 hybrids, licensed inspected, bloodtested. Rush postal, large colored book Free, low prices. Berry's Farm, Route 11, Clarinda, Iowa.

43 DOGS, BIRDS, PETS, RABBITS

RAISE guaranteed Chinchilla rabbits. Greatest profits from gorgeous furs, delicious meat, valuable breeders. Experience unnecessary. Fascinating hobby. Year-round money-making business. Write world's largest breeder today. Willow Farm, R-17, Sellersville, Penna.

$5,000 YEARLY possible raising Angora rabbits our Co-operative marketing plan. Iowa Angora Association, Cedar Rapids, Iowa.

GREAT Danes; Apollo of Dogdom for Protection and companionship. $100.00 upward. Shipped on approval, time payments. Kalmardanes, Stone Mountain, Ga.

RAISE rabbits. Market provided, breeding stock furnished on Production Pay Plan. Literature 25c with hutch plans $1. Hansen's Rabbit Institute, 1347 Miller Avenue, Salt Lake City 6, Utah.

RAISE Guinea Pigs. Make money at home. Big demand. Booklet free. Taylor, Box 426B, Hapeville, Georgia.

YOU Can make real money raising Golden Hamsters, the new amazing tiny animal. Food costs less than 10c month per animal. Breeds in 16 days! Easily raised in basement, attic, garage, barn or shed. Write for convincing details. Hudson Hamstery, R.F.D. 1, Newfoundland, N. J.

ANGORAS, giant Chinchillas — Heavy-producing prize winners. Literature free. Grinsteads, Edwardsville, Illinois.

GOLDEN Hamsters—Novel Easter pets. $5.00 Brings breeding age pair including two metal cages, instructions. Hathaway Hamstery, 609 Deerfield, Silver Spring, Maryland.

SEND 25c for monkey, bird and pet supply catalogue. Tampa Pet Supply Co., Tampa, Fla.

60 FROG RAISING

"FROG Raising." New book teaches how. Marlborough, 1035 Marlborough, Detroit 15, Michigan.

62 FUR FARMING

KARAKUL sheep breeders for sale. Write Addis Kelly, Maywood, California.

83 MILK GOATS

RAISE Dairy Goats. All about goats and goat milk in big, illustrated monthly magazine. Sample copy 25c. Special Introductory year subscription only $1 (regular $2 a year). Booklet, "Primer for Goatkeepers", Free on request. Dairy Goat Journal, Dept. 868, Columbia, Mo.

116 REPTILE PRODUCTS

NEW Reptile catalogue 10c. Biological hobby catalogue 10c. Current Reptile bulletin 5c. Chameleon 25c. Quivira Specialties, Topeka, Kansas.

52 FARMS, OTHER REAL ESTATE

FLORIDA — Hunting, Fishing, Fruit Growing. 5 Acres, $245.00, $10.00 Down, $10.00 a month. G. B. Potterfield, Route #1, Brooksville, Florida.

FARMS, Ranches. All kinds, sizes. Choice of location, climate, production. Information on irrigation projects Columbia and Missouri River Basins. Resorts, summer homes. Milwaukee Railroad territory: Washington, Idaho, Montana, Dakotas, Wisconsin, Upper Michigan, Central Corn Belt. Free folders, price lists. L. H. Robbins, 613 Union Station, Chicago 6, Illinois.

STROUT'S Big Farm Catalog—Mailed Free. Describes over 2,800 outstanding Bargains. Coast to Coast. Time-Money Saver. Write Today. Strout Realty, 255-ZB 4th Avenue, New York 10, N. Y., 20 W. 9th St., Kansas City 6, Mo., 453 S. Spring, Los Angeles 13, Calif.

OZARK Lands for All purposes. Actual river frontages, 5 acres $90.00 and upwards. Free list and literature. Hubbard, 424K Minnesota Ave., Kansas City 4, Kans.

GOOD FARMS—Ranches. Washington, Minnesota, Montana, Idaho, Oregon, North Dakota. Dependable crops, favorable climate. Write for literature, lists describing typical farm opportunities. Specify which state. J. W. Haw, 120 Northern Pacific Ry., St. Paul 1, Minn.

HOMESITES $450—convenient payments. California's finest garden section. On Morro Bay's scenic shores. Wonderful fishing, hunting, boating, bathing. Fertile soil, softest water, temperate climate, congenial community. Free literature. Richard Otto, 6560-Z, Hollywood Blvd., Hollywood 28, California.

10 ACRES good land $250.00, $10.00 down, $10.00 monthly. R. W. Stewart, Inverness, Florida.

FLORIDA Highlands—Lots $50.00 farms $100.00. Monthly payments. Delker—2219 Venango, Philadelphia 40, Pennsylvania.

108 POULTRY AND SUPPLIES

RAISE turkeys the new way, write for free information explaining how to make up to $3,000.00 in your own backyard, address National Turkey Institute, Dept. 57, Columbus, Kansas.

RAISE Poultry for profit! Learn how others succeed. Read America's leading poultry magazine. 24 months only $1.00. Subscribe today! Poultry Tribune, Dept. T, Mount Morris, Ill.

111 PROFITABLE OCCUPATIONS

ANNOUNCING home study course in commercial baking. Practical basic training. Good field for those with aptitude. Nearly depression proof. Send for Free booklet, "Opportunities in the Baking Industry." National Baking School, 1315 Michigan Ave., Dept. 1723, Chicago 5, Ill.

IDEAL Mail Sellers—Over 100 selected new products listed with sources. Every seventh order sent Free. Money returned $1.00 postpaid. Public Educational Service, 493 Irving, Bridgeton, N. J.

$40.00 WEEKLY. Made growing mushrooms. Fresh. Dried. Dominion Patent 331.543, free spawn. North American, 169Y Yonge, Toronto, Canada.

$5000. from half acre growing Ginseng. seed supplied. Crop bought. Particulars 10c. Associated Growers. 1169 Corydon Ave., Winnipeg, Canada.

DETECTIVES Earn Big Money. Excellent opportunity. Detective Particulars free. Write, Wagoner, P-125 West 86th, N. Y.

MUSHROOMS Grown. Boxes, Barrels. Instruction 50c. Spawn $1.00. Gordons, 553 William, Winnipeg, Manitoba.

WANT advice on mail order, Brand-new folio gives author's experience. $2.00, postpaid. Satisfaction guaranteed, A. L. Marks, 540 Blaine Avenue, South Bend 16, Indiana.

YOUR own business painting flagpoles and smokestacks. Particulars free. Skyline Co., 1601-A, Uniontown, Pa.

$150 PROFIT in 4 days made by Floyd Brown, Iowa. You, too, make Big Money in your own profitable business with amazing Liquid Imitation Marble, Fibre-Tite Flooring and Flexible Molds. Full or spare time. Experience unnecessary. Work from your own home. Write for Free Catalog, full information today! Composition Products Co., Dept. 23, 5853 Delmar, St. Louis, Mo.

MAKE beautiful costume jewelry at home for large profits, hobby or therapy. Free illustrated wholesale catalogue of sea shell, metal and plastic parts contains detailed instructions. Florida Supply House, Bradenton, Florida.

PROFITABLE business in making and building with interlocking blocks. Delaware Industries, Dept. 20, Muncie, Indiana.

MAKE Perfume, profitable, sparetime, home, business. Men, women write "International", 6347 Parnell-S16-Chicago 21, Illinois.

EXTRA money? Free Details. Trable, 1018½ Elm Street, Dallas, Texas.

START lamp factory. Profitable, fascinating, easy to learn. Illustrated course teaches you. General instructions, wholesale catalog $1.00. Gearon Company, 6405H North Oakley, Chicago.

RAISE Rabbits. Easy to start. Very profitable. We teach you details free. Harder Farms, Rt. 1, Box 186, Campbell, Calif.

900% PROFIT. Stamping key-protectors, dog-tags. Arrington's, LaGrange 15, Georgia.

ELECTROPLATING Has a thousand and one uses. Make good money in spare or full time. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free sample and literature. Warner Electric Co., Dept. PO-P3, 1512 Jarvis Avenue, Chicago 26, Ill.

DO it with Sea Shells. Attractive Jewelry, Novelties. Big profits, instruction. Supplies Wirts, 1429—56th Avenue, Oakland 3, Calif.

MAKE beautiful mirrors from ordinary window glass. No expensive equipment required. Details free. Tes-co, Box 189-SE, Wilkes-Barre, Penna.

22 BOOKS, PERIODICALS, ETC.

EDUCATIONAL Books sold cheaply or rented for small fee. Books bought. Money-back guarantee. 4,000 Bargains. Catalog Free. (Courses Bought.) Lee Mountain, Pisgah, Alabama.

MAGAZINE Bookmen, mail dealers. Increase your income. Sell new lawn book to home owners. Price $1.00; dealers fifty cents. Leslie Kerr, 3825-D Tenth Street, Washington 10, D. C.

BOOKFINDERS! (Scarce, out-of-print, unusual books.) Quickly supplied. Send wants. Clifton Company, Box 1377 PS, Beverly Hills, Calif.

"ADULT bookalogues." 25c. Fifteen—$1.00! Free catalogs! Hirsch, Spring Valley 3, N. Y.

HORSE racing books, systems. Free illustrated catalogue. Charles Hall, Sepulveda, Calif.

MAGAZINES—Business, vocational, diversion. Current single copies. All fields. Price list free. Commercial Engraving Publishing Co., 348 North Ritter, Indianapolis 19, Indiana.

MAGAZINES (back dated)—foreign, domestic, arts. Books, booklets, subscriptions, pin-ups, etc. Catalog 10c. (refunded). Cicerone's, 863 First Ave., New York 17, New York.

SELL Books by mail. 100% profit. World-Press, Columbia City, Ind.

BOOKFINDERS! All subjects. Send wants! Jaher Book Service, 620-K East 178 Street, New York 57.

BACK-Date Magazines, Books. Specific issues—years. Arkell's, Tarzana, Calif.

DECORATE home, cabin, workshop; Brilliantly-colored outdoor pictures 25c, 7 for $1. Adults Books 25c, 6—$1. Sell out list free. Persil, 436-S N. Y. Ave., Brooklyn 25, N. Y.

1948 CATALOG, wholesale directory, 10c. Latshaw Sales, Sunnyside-C, Indianapolis 44, Ind.

AMAZING new books. Joseph A. Vallon, 22 East 17 St., New York 3.

MEN Only. Fresh stuff in little Books. 10 for $1.00. DuLaw Novelties, Box #297, East Chicago, Indiana.

ADULT Books, revealing sex truths—illustrated, 50c. Kogan, 1032-SA, New York 8.

"LOVE Ruthbella"! Intimate diary confessions;—privately published $5 book now reprinted, price only $2.00. Make this excitingly beautiful, picturesquely revealing tome your secret delight! Confidential listing: "Lonely Hour Books" included. Send two dollars today for the book thrill of your life. Poets Corner Press, 436 Center Street, Fort Lee, N. J.

"THE Great Pyramid", scientific marvel of the ages. Reveals fate of the nations. 28 illustrations, price $1.00 postpaid. Truth Pub. Co., Box 1027, Enid, Okla.

81 MAGIC TRICKS, PUZZLES, ETC.

MAGICIANS', Gamblers' secrets exposed. Cards, Dice, Punchboards, Slot Machine. Catalog 10c. Book Co., Box 671, St. Louis 1, Mo

WORLD'S largest professional magic shop, keeps you in touch with latest tricks. To receive mailings, send 35c for new catalog. Holden's, 220-P West 42nd St., N. Y.

500 PAGE catalog, 6,000 noveities, gadgets, timesavers, hobbies, fun-makers, etc. 10c. Johnson Smith, A-74, Detroit 7.

200 ELECTRIC Stunts, 110 volts, $1. Cutting Sons, Campbell 3, Calif.

COIN & ring trick! Mystifies, amuses! 35c with descriptive list of fun and magical items. Gift for promptness. Powell's, P.O. Box 2155A, Potomac Station, Alexandria, Va.

REMARKABLY Inexpensive pocket tricks! Catalogue, 5c. Postways, Box 5325-Z, Philadelphia 42.

HYPNOTISM! 25 Lesson Course, $1.00. Monarch, 38-S Jefferson, Auburn, New York.

BE a Magician. Large professional magic catalog of latest tricks, 25c. Ireland, F-109 North Dearborn, Chicago.

MAGICIANS' Headquarters — 400-Page Professional Catalogue, pocket, parlor, stage tricks. World's finest magic. Send $1.00 for Catalogue (refunded first $5.00 order). Kanter's, S-1311 Walnut, Philadelphia 7, Penna.

500 TRICKS. Send only 10c for Douglas' famous 112-page Catalog 500 Tricks. New magic for amateur, professional. America's fastest service for 25 years. Douglas Magicland, Dept. 2, Dallas, Texas.

LEARN magic, Ventriloquism, Mindreading. Write for particulars. Quackenbush, Big Flats, N. Y.

MASTER cigarette vanisher will fool even your wife! Penny that nails to floors. 25c (Wholesale). Catalog 10c. Scheetz's, Sellersville, Penna.

"MAGICIAN'S Pin, Ghost Illusion, "Magic Book", Giant Catalog. Everything complete 35c. Magic Wand-M, 9W, Colorado, Pasadena, Calif."

4" TROPICAL Tarantulas. Lifelike. Extremely startling. Handmade, 2 for $1.00. Moak, 322 Shandon, Columbia, S. C.

STARTLING sensational; Melt steel like lead; Runs like water. Anyone can do it. Secret, $1.00. James, 4638, N.E. 34, Portland, Oregon.

"MASTER Course in hypnotism" Tells you how! New 1948 photographically illustrated edition—$3.00. Fascinating science, now easy to learn. Power Publishers, 790 Broad St., Newark, N. J.

MAGICIANS Catalog plus Mystic card that vanishes coins—25c. Steiner's Magic, 316 East 61, New York.

HYPNOTIZE immediately! World's largest dealer offers jumbo hypnotism catalog 25c. Nelmar, 2820 No. Lawndale, Chicago.

VANISHING Quarter trick and catalog 25c. Sterling Magic Co., Royal Oak, Mich.

LARGE 160 page catalog, just published, 35c. We have supplied the best tricks to beginners and professionals for 38 years. Chicago Magic Company, 2300 No. Mason Avenue, Chicago 39.

63 GAMES, ENTERTAINMENT

WIN at Poker—Use the system of experts—$1.00. Mansfield Studios, Westford, Vermont.

HOME Model Slot Machines and Coin Operated Games. Write for catalog. Webb Distributing Co., Dept. P4, 6 South Kedzie Ave., Chicago 12, Ill.

36 COIN COLLECTING

FREE! Foreign coin, banknote and Coin Collectors' Illustrated Catalog to approval service applicants. Send 3c postage. Tatham Coin Co., Springfield-D50, Mass.

UNUSUAL worldwide collection twelve different foreign coins and bills only 25c. Webb, Box 473, San Bruno, Calif.

OLD Money wanted. Will pay $100.00 for 1894 dime, S. mint, $50.00 for 1913 Liberty head nickel (not Buffalo). Big premiums paid for all rare coins. Send 4c for large coin folder. May mean much profit to you. Numismatic Co., Dept. 30, Fort Worth, Tex.

40 MIXED Indian Pennies $1.00. 50 different foreign coins $2.00. Internat'l, 656 West 171, N. Y. 32.

100 FOREIGN coins $4.00. Postpaid. Parker, 1122 Market, San Francisco 2, Calif.

COMMEMORATIVE $½ — Columbus, Washington, Cleveland, Stone Mountain, $1.50 en. Illustrated Catalogue 25c, Norman Schultz, Salt Lake 9, Utah.

INTRODUCTORY offer—U.S. Rare Coin Value Guide 30c—send postal note to Hobby Helpers, Dept. S-2, Box 665, Washington 4, D. C.

$2.00 TO $200 each paid for hundreds of Old or Odd Coins. Indian-Lincoln-Foreign Wanted. Keep all until posted. Send 20 Cents for illustrated Coin Value Book, 4 x 6. Guaranteed Prices, 40 years in business. Coin Exchange (1), Le Roy, N. Y.

START COIN COLLECTING RIGHT! Save money, avoid mistakes. Complete beginners' outfit $3. Deluxe numismatist's kit $5. Satisfaction guaranteed. Coin bonus if you hurry! Kirkham's, Glens Falls, New York.

100 MIXED foreign coins $3.00. Del Monte, 725 West 172, N. Y. 32.

RARE 1922D Lincoln cent 15c. Reynolds, 118-B Mathews, Flint 3, Michigan.

BARGAINS—All different dates—3 Large cents $1.00, 20 Indian cents $1.00, 4 2c $1.00, 4 3c Nickels $1.00, 4 Whitman Coin Albums $1.00, 254 page guidebook $1.50; Handbook 75c. Our large retail catalogue 15c. Above lot $6.50. Bebee Coin Company, 1180 East 63rd, Chicago 37, Illinois.

U.S. coins lowest prices. Send stamp for lists. Hutchinson, 3463 I Street, Philadelphia 34, Penna.

CLOSING out:—435 antique firearms;—35,000 coins, relics, cartridges, swords, flintlocks, carbines, antiques, minerals. Illustrated Catalog 25c. Heike, Wenona 31, Ill.

50 WORLD coins $1.00. Harry Elsholz, Box 9014, Pittsburgh 24, Penna.

96 OLD STAMPS WANTED

I WILL pay $100.00 each for 1924 1c green Franklin stamps, rotary perforated eleven (up to $1,000.00 each unused). Send 10c for large illustrated folders showing Amazing prices paid for old stamps, coins, and collections. Vernon Baker, PS-83, Elyria, Ohio.

127 STAMP COLLECTING

DEALER'S Wholesale Catalog. Postage 3c. Frankson, 5031 Queensbury, Baltimore, Maryland.

300 DIFFERENT given free with approvals. Postage 3c. Windsor Stamps, 1435 E. 67th Place, Chicago 37.

ZOWIE-E-E! A Barrel of Fun for only a Dime! 500 United States Stamps—Absolutely unpicked and unsorted, just as received from church missions. Many varieties, including large commemoratives, airmails, high denominations up to $5.00! Stampdom's biggest package of fun, and you might find something really valuable!! Price only 10c to serious approval service applicants. Money back if not delighted. Illustrated bargain lists with each order. Mystic Stamp Co., Dept. 55, Camden, New York.

UNITED STATES approvals complete coverage fine quality, attractive prices. Seminole Stamps, Box 1138-S, Coral Gables, Florida.

START your own stamp business. Write for free circular. Donald Shepard, Box 5139, Chicago 80.

WOW!! $10.00 Worth Of Fun—Only 10c! What a treasure hunt! Big package 500 Foreign Stamps from foreign missions, other sources. Includes Stamps from Africa, South America, Free French, Somali, Palestine, etc. Includes airmails, commemoratives and stamps worth up to 50c. This offer sent for 10c to Approval Applicants only. Jamestown Stamp Co., Dept. 5, Jamestown, N. Y.

128-PAGE United States Catalog, 1,000 illustrations, 10c. Harris & Co., 204 Transit Bldg., Boston.

NICARAGUA "Tin Pan Alley" Diamond, Ecuador showing George Washington, and American Flag in natural colors, Fezzan, Trieste, "American Army" stamp First U.S. Commemorative, $100.00 Shanghai, Corsica, Anzac, Antique, others all 5c approvals. Capital Stamp Co., Dept. 10, Little Rock, Ark.

FREE—Famous Americans set, plus Flag set, plus the National Parks set, plus the Presidential set to the $5. A total of 90 stamps absolutely free to customers for our unsurpassed United States or Foreign selection. Send 3c postage for 15 of the above mentioned stamps and full particulars. Triboro Stamp Company, 145 Nassau Street, Dept. 205, New York.

FREE, Stupendous Amazing Mammoth Collector's complete outfit, including large Scott Album, all needed accessories, plus over 1,050 selected all different stamps, including rare high values, airmails, triangles, countless beauties; total value over $25.00 given absolutely free to approval applicants becoming customer. Thrifty Stamp Service, Box 132, Los Angeles 53, California.

200 DIFFERENT stamps, 6c, to approval service applicants. Tatham Stamp Company, Springfield 50, Mass.

WORLD'S Largest Stamp (7½ x 14 inches). A real curiosity! Retails for 50c, only 3c to approval applicants. Tatham Stamp Co., Springfield 50, Mass.

200 DIFFERENT, including Roosevelt triangle, 5c to approval applicants. S. Avalon Stamp Co., Springfield, Mass.

CHOICE of 35c Worth of stamps from our first U. S. selection Free to applicants enclosing 3c postage. Large selection to choose from. Act Now!!! S. D. Engel & Co., 38 Park Row, N. Y.

"CONFEDERATE-States" twelve different unused 10c approval applicants only. "Stamps", Box Eighty-Seven, Albany 1, N. Y.

FREE, Fascinating Airmail Collection, including obsolete Liberian issue with approvals. 3c postage please. Raymax, 123-X William St., N.Y.C. 7.

DISTINCTIVE Approvals, desirable foreign stamps, reasonably priced. Several interesting features included. Send 3c stamp for particulars. Strecker, 1800C South 58th Street, Philadelphia 43, Penna.

STAMPS 100 Years Old. Every collector should have at least a few stamps nearly 100 years old. Although hard to get, we offer a wonderful selection of ten old 19th century foreign stamps and also the blue re-issue of the 100 year old first U. S. stamp, the famous 5c Franklin. All for only 10c. Kindly state whether approvals shall consist of U. S. or Foreign Stamps or both. Globus Stamp Company, 268 Fourth Avenue, New York 10, N. Y.

POSITIVELY Greatest Free Offer—Latest Scott's International $6.00 stamp album—covering entire world, contains 36,000 illustrated descriptive spaces; Scott's 1948 Standard $7.00 catalogues "Philately's Encyclopedia"—absolutely free to applicants for foreign approvals becoming customers. Plymouth Specialty Company, Dept. A3, Bell, California.

31 DIFFERENT with George Washington Stamps, from Brazil and Ecuador; Pirate Island; Victory issue; Medical set; others—all 4c with approvals. Grayson Stamps, Sherman, Texas.

VICTORY Packet Free—Includes stamps from Tanganyika—British Cayman Islands—Animal—Scarce Babyhead—Coronation—Early Victorian—Airmail—Map Stamps—Including big illustrated catalogue. Send 5c for postage. Gray Stamp Company, Dept. P, R, Toronto, Canada.

SCARCE United States stamps nearly 100 years old: Roosevelt set complete; $5.00, $10.00 stamps; Army, Navy, Marines, Coast Guard, Columbian Exposition, Commemoratives; 19th Century Revenues. Everything 5c to Buyers U.S. approvals. Metropolitan, 140-A Nassau, N. Y. C. 7.

FREE! Porto Rico Airmail Triangle (World's Only American Colonial Triangle!) Cook Islands, Syria, Ivory Coast, Damascus, Elephant Land, Cambodia, Harem, Philippine "Slave", others. All Free for 3c postage. Approvals. Belmont Stampco, Washington 10, D. C.

FREE! Tiny Chinese "Midget" War set Approvals. Seminole, Elliston 10, Va.

200 DIFFERENT Stamps—cataloging up to 15c each—only 3c to approval applicants! Littleton Stamp Co., Littleton 47, N. H.

200 DIFFERENT Stamps, 6c to approval service applicants. Nationwide Stamp Company, 1323 E. 16 St., Brooklyn 30, N. Y.

STAMP remover 25 cents. Free with approvals. L. White, Box 922, Pittsfield 2, Mass.

SOMETHING New! Inexpensive, value loaded "Pakettes" on approval. Mail-O-Mart, 1730 Ashland, Santa Monica, Cal.

FREE! Complete Balkan aviation set with approvals. Beaman, Elliston 10, Va.

25 NETHERLANDS free. Approvals. Country Stamps, R76 B794, Tacoma, Wash.

FREE! Triangle Roosevelt, Vatican, Ethiopia, Hitler Heads, with Approvals. Florida Stamp Company, Box 807, Miami, Florida.

FREE—The Stamp Finder. Big new edition—32 pages profusely illustrated. Identifies all difficult stamps immediately. Given free with 319 different stamps from Vatican City, Palestine, Cyprus, San Marino, etc. All sent to approval applicants for only 10c. Price lists. Garcelon Stamp Company, Box 818, Calais, Maine.

BRITISH, Spanish, French Colonies, Vatican, Hitler heads, and airmail packet, free with approvals. Pan-American Stampco, Box 145, New York 33, N. Y.

BET you haven't these! South Georgia, South Orkneys, Grahamland, South Shetlands, Shortlived Walkland Dependencies. Everything 3c with approvals. Viking, 130-P, Clinton St., Brooklyn 27, N. Y.

15 DIFFERENT U. S. over 40 years old, 10c special to applicants for our bargain U. S. approvals. Will Fortney, 1806 East 22 St., Brooklyn 29, N. Y.

UNITED STATES Price list. Send Postage. State Stamp Corp., 1225 Park Bldg., Pittsburgh 22, Penna.

FREE U. S. Price list postage 3c. M. Hanna, 335 5th Ave., Pittsburgh 22, Pa.

50 DIFFERENT United States 10c Price list free. Seidenberg, Cassopolis, Mich.

SELECTED penny approvals. Henry Jay Service, 15 Park Row, New York 10, N. Y.

FREE Catalog. Mint sheets U. S. exclusively. Kenda, 82 New Jersey Ave., Brooklyn 7, N. Y.

$1.00, $2.00, $5.00 U.S., Roosevelt, Hitler, Airmails, free with approvals. Tamiami Stamps, Box 2188, Miami 13, Fla.

PENNY Approvals that satisfy. Neil Gronberg, Box 5441S, Philadelphia 43, Pa.

25 DIFFERENT Stamps 10c. Tunis And Carpenter, Wakeman Ave., Newark 4, N. J.

U. S. 797 SPA Sheet only 5c to applicants for U. S. approvals. M. Haycock, 333—86th St., Brooklyn, N. Y.

FLAG Stamp Free With U.S. Approvals. E. Wenigman, 929 Oakdale, Chicago.

OLD scarce U. S. Seconds on approval. Slightly defective, bargain prices. Hearnfeld, 551 Clinton, Newark 8, N. J.

50 DIFFERENT Hungary stamps and our price list, one silver dime. Stampsales, Box 1649F, Oakland 4, California.

TRIANGLES included in packet 50 dif't. to new approval applicants for 5 cents. Harford Stamps, Box 68, Parkville 14, Md.

5 SETS—Five countries—Triangle, Orchid, Maps, Animals. With approvals 5c. Arthur Wirth, Norwichtown 2, Conn.

ROGUES Gallery Packet, Hitler-Mussolini, 30 others, 3c. Premium Hartland 6, Pa.

3 AFGHANISTAN 10c big list 300 other dime packets. Ewing-Stamps, 109 N. Dearborn, Chicago 2.

HISTORICAL Collection!CavalryCharge! (Bulgaria)—Flaming Sword! (Ireland)—Big She-Wolf! (Italy)—Fort! (Dominican Republic)—Field Marshal! (New Zealand)—Pitcairn Mutiny Island!—Commemoratives! Pictorials! Only 3c. Approvals. Star Stamp Company, Dept. 1, 11 East 15 Street, Jamestown, N. Y.

GIVEN free;—Roosevelt, Churchill, Hitler, Mussolini. Illustrated pricelists. Imperial Company, Box 1491, Tampa, Florida.

BRAZIL-Truman commemorative only 10c to approval applicants. Floyd Frederick, 513½ Green Street, Lancaster, Penna.

"GOYA Nude" set complete mint 35c. Approvals. Royal Stamp Company, Tamaqua 2, Penna.

FIRST day covers on approval. Bob Knobel, 1918 S.W. 12th Street, Miami 35, Florida.

CLEARANCE Commemoratives, sets, pictorials, bicolors, 25c and $1. Schneider, P. O. Box 1012, Chicago 90.

FIFTY stamps from fifty countries, 10c. Garrow, 84-D Montevista, Chulavista, California.

COLLECTORS outfit, Album, Hinges Gauge, Detector, 50 different stamps, 2 mint sets all 10c. Approvals. Carneta, 228 West 25th, N. Y. 1.

WORLDWIDE Different: 200-25c; 500-60c; 1000-$1.50; 2000-$4.25. Beacon Sales, Maynard 3, Mass.

UNITED States 2c Yorktown unused; 100 mixed U. S. used all 10c with approvals. Hudson Co., Box 229 Whittier, Calif.

FREE: Twenty different foreign commemorative stamps to new approval applicants. Modern Stamp Service, Box 12A Wakefield Station, N. Y.

NO JUNK here! High catalogue mint-commemorative collection only 5c. Approvals. Sunlite, 29 Lincoln Road, B'klyn 25.

FREE—World's only octagonal (eight-sided) stamp and Turkey set to approval applicants. Charles Cleaveland, 806 North Humphrey, Oak Park, Illinois.

FLAGS! FLAGS! Flags! Beautiful collection foreign flag stamps-plus perforation gauge-plus packet 25 countries, including big Roosevelt triangle, airmails, scarce Tasmania, Negri Sembilan, old Victoria, etc. Total value $1.00. Bargain price 10c to approval applicants. Odd Stamps Company, Dept. D1, 5391 Metropolitan Station, Los Angeles.

FINE Approvals. Fast, personal service. What countries do you prefer? I'll send their stamps. Milton Skinner, 438 Locust, Long Beach 12, Calif.

WONDERFUL! Roosevelt Triangle, Negri Sembilan, Perak, Kedah, St. Vincent, set Nigeria, Italian Africa and numerous other. Everything 10c with approvals. Phipps Stamp Mart, 10993 Wellworth Ave., Los Angeles 24, Calif.

U. S. Approvals, used or mint. Panther's, Box 52-S, Dorchester 24, Mass.

WORLD wide 200 27c, 400 47c. Pacific, P. O. Box 5704, Los Angeles, Calif.

FOR Better U. S. approvals write today—Reasonable—Box 488 A, Minneapolis.

TWO Old U. S. mint stamps—1917-1922, Nos. 498; 554 free to general approval applicants. Middleton Stamp Co., 78-14 Woodside Ave., Elmhurst, N. Y.

TRIANGLES! Diamonds! Midgets! Roosevelts! Hitlers! U. S. $1.00-$5.00! Big stamp magazine! Everything 6c! Approvals. Thrifty Stamps, Silver Spring, Maryland.

BRAZIL Diamond shaped set, 10c with approvals. Vargo Stamps, 6044 South Fairfield, Chicago 29, Illinois.

UNITED States on approval. Fast service. R. Needham, P. O. Box 818, Inglewood, California.

GIANT bicoloured royal visits, Malta pictorials, gorgeous Guianas Goose Airmail, Scandinavian packet and illustrated stamp publication 10 cents with approvals. Crown Stamps, Box 331, Toronto, Canada.

MINT Hitler heads, 18c Scotts #506-523 for only 25c. Blocks of four $1.00. Reich Stamp Co., 4647 Kenmore, Chicago 40, Ill., Dept. S16.

TERRIFIC! Globe girdling packet from fifty countries 10c! 200 different U. S. $1.00. Thousand mixed 35c. To approval applicants. AAA Stamp, Arcade Building, St. Louis, Mo.

FREE illustrated bulletin showing new recent issues. Penny approvals on request. Reed Company, Box 960, Chicago 90, Illinois.

100 STAMPS, album, hinges—20c. Box 6618, Northeast, Kansas City, Mo.

STREAMLINED Approvals of U.S. or Foreign stamps. Service and economy instead of premiums. Roberts, P. O. Box 796, New York 8, N. Y.

COLOSSAL—10,000 different stamps, 1c each. Sochor, 1508 Dickinson, Philadelphia 46, Pa.

ROOSEVELT, Hitlers, etc. 110 different 15c. Buckey, PS-206 Ludlow Bldg., Dayton 2, Ohio.

70 HOBBIES, COLLECTIONS

INVENTING can be an interesting and profitable hobby. Write for complete particulars. Institute of American Inventors, Dept. 30-E, 2926-Eye St., N. W., Washington 6, D. C.

10 ANCIENT Indian arrowheads $1.00. List free. Lear's, Kirby, Arkansas.

500 PAGE catalog, 6,000 novelties, gadgets, timesavers, hobbies, fun-makers, etc. 5c. Johnson Smith, A-75, Detroit 7.

24 DIFFERENT pictorial comic buttons $1.00. Theron Fox, 1024-A Carolyn Avenue, San Jose 10, Calif.

UNUSUAL hobby. Earn $10.00 day, in home. Full instructions $1.00 bill and large self addressed envelope. Textscraft, Box 75, Pierson, Iowa.

UNUSED Match Book Covers. 100 all different $1.00. Free catalog. Charles Edelman, 1311 P East 84, Cleveland 3, Ohio.

GIANT flowers, fruits, vegetables grow in water quickly, easily for profit or pleasure. No hothouse. All year round. Full instructions and chemicals. Send $1.00 bill. Devons Laboratories, Box 6016, Five Points Station, Raleigh, N. C.

EXCHANGE duplicates. Swappers everywhere. List free. Box 2166-S, Denver 1, Colorado.

ULTRAVIOLET hobby bulletin free. Instructive, fascinating. Mission Mart, 818 Fort Stockton Drive, San Diego 3, Calif.

8 ANTIQUES, RELICS, INDIAN GOODS

CLOSING out:—435 antique Firearms:—25,000 coins, relics, cartridges, swords, flintlocks, carbines, antiques, Minerals. Illustrated Catalog 25c—Heike, Wenona 32, Illinois.

85 MINERALS & PRECIOUS STONES

GOLD—genuine ore sample, 25c. Metallic Mine, Searchlight, Nevada.

ROUGH gem material for cabachon cutting Australian Opal $20.00 per Oz. Choice African Tigereye $5.00 lb. Lawrence Gem, Box 1396 Milwaukee, Wisc.

GENEROUS assortment slabbed gem material one dollar; carnelian agate grab bag, fifty cents. M&O Gem House, Mesilla Park, N. M.

GEMS, precious and semi-precious, all genuine from world wide sources. Deal direct, no overhead, save money. Catalog 10c. Hill Co., Route 7-K, Salem, Oregon.

26 CAMERAS, PHOTO SUPPLIES

OIL coloring photographs can be a fascinating hobby or profitable sideline for those with artistic talent. Learn at home. Easy simplified method. Send for free booklet. National Photo Coloring School, 1315 Michigan, Dept. 1742, Chicago 5, Ill.

BASS says! At the sign of the old "Horse Trader," 38th year. Thousands of satisfied customers everywhere! Finest brands including Kodak, Bell & Howell, Argus, Zeiss, Leitz, etc. Satisfaction always guaranteed or your money back! Bass buys 'em, sells 'em, trades 'em. Write or wire. Bass Camera Company, Dept. AG, 179 W. Madison St., Chicago 2.

ARTIST'S Models: 15—$1. Sample 25c. Sparton Sales, Box 2100, Cleveland 8, Ohio.

MAKE Camera for your microscope! Take microphotos of pond life, etc. Complete kit, plans, $3.00 postpaid. Storytell Studio, Box 72, Old Chelsea Station, New York 11, N. Y.

200 POWER telephoto camera easily made. Trifling cost. Free details. Suffolk Science Service, Manorville, N. Y.

ENLARGER? Build your own cheap, we show you how. Complete plans $1.00. Somerset Specialties, 10514 Somerset, Detroit 24, Mich.

CAMERA'S-Enlarger's — Movie Film — Big Free Catalog. Cavalier Camera, 1822 Center, Pittsburgh 19, Penna.

102 PHOTO FINISHING

THREE prints each 8 exposure roll 40c. Two each 35c. One each 25c. Reprints 3c. Fred A. Eastman, Bode, Iowa.

8 BEAUTIFUL Double Size pictures and roll developed 30c, 8 hour service. Free Mailers. Pacific Photo Service, Box 666, San Francisco, Calif.

PHOTO copying. Mail picture, and only one dollar. We will make negative, and proof. Kino Service, 2042 South Eight Street, Milwaukee 4, Wisconsin.

50 VELOX reprints, $1. Suburban Studio, 1410-S Bond, Rockford, Ill.

SENSATIONAL Introductory Offer! Send snapshot or negative, this ad and 10c. We'll send you a beautiful 7 x 5" enlargement! Or, Kodak roll developed and printed (with free coupon) only 25c; or 8 Giant prints from roll, 30c. Reprints from negatives—any quantity—regular size, 3c; Giant size 4c. Candid rolls—36 exp. 35mm developed, vaporated, enlarged to 3 x 4, $1.00. 18 exp. 50c. Free Mailers. Free Premium offers sent on request. American Studios, Dept. 365, LaCrosse, Wisconsin.

ENLARGEMENTS 5x7 15c, 8x10 25c. Glossy or dull. Gorgeously oil colored 50c. Rolls developed and printed 25c. L & R, P. O. Box 1476, Milwaukee, Wisconsin.

ROLL developed, 8 prints and two enlargements 25c. Trial offer. Young Photo Service, 406-C, Albany 2, N. Y.

FINEST quality. Fastest service guaranteed. Roll developed and 16 Velox prints, 25c. Reprints 2c. 100 $1.50. Dick's Photos, Louisville, Ky.

3—8" x 10" ENLARGEMENTS, $1.00. From negative or photo. Cosmo Photos, 829 6th Ave., N. Y. C.

PROFESSIONAL 8 x 10 enlargement 50c. Three, $1.00. Rush negative! Mosher Studios, Vineyard Haven, Mass.

CANDID Type negative enlarged 5 x 7—25c. Colored 50c. Hill Photos, Greensboro, Vermont.

TWO Beautiful prints from each picture on roll 25c. Twenty-seven years of satisfied customers. Quick service. Lens Photos, Dept. J9, Janesville, Wis.

BEAUTIFUL enlargement from each picture on roll 25c. Cut Rate Photos, Dept. A6, Janesville, Wis.

104 PHOTOPRINTS, PHOTOCOPIES

PHOTO Pacific area, 17—$1.00, 80—$5.00, native girls 15—$2.00. Novelty Sales, Wolfitt Ave., Norwalk, Conn.

90 MOTION PICTURES, SOUND EQUIPMENT

BEAUTIFUL Kodachrome Slide and Lists 25c. Slide Supply Service, 3111 West Tuscarawas, Canton, Ohio.

8—16mm. SILENT—sound art films. International, 2120 Strauss, Brooklyn, N. Y.

8-16MM. Silent-sound films. Complete rental library. All latest subjects. Free catalogue. (sample film 10c). Garden Film, 317 West 50th, New York 19.

MOVIE Film Processing—Finest automatic machine processing. 8mm., 16mm. 48 hour service. Also duplicating, editing, titling, other lab services. Send for list of prices. Fotoshop, Inc., Room 122, 18 E. 42nd St., New York City.

MOVIE Film At Tremendous Savings! Kodak Super X, Gov't stock. Tested—Guaranteed! 16mm 100 ft. $2.95; 50 ft. Magazine $2.50; Double 8mm 25 ft. $1.65. Super XX. 50c add'l. each roll. Free processing. Fast service. Photo-Surplus Sales, Box E-9, 12 Duane St., New York City.

ART Films: 50' 8mm. $2.75; 100' 16mm. $5.00; 100' 16mm sound, $7.50. Catalog Free. 16mm Viewer with 150 Art Figure Poses, $2.00 postpaid. Bruno $2\frac{1}{4}$x$3\frac{1}{4}$ Art Negatives, 6 for $3.00 postpaid. Beautiful 35mm Color Art Slides, 10 for $3.50 postpaid. Seconds, 25 for $3.95 postpaid. Fresh Ansco 20 exposure 35mm Color Film, 3 rolls for $4.50, plus 15c postage. Gamerman's, 3808-C Eastern Avenue, Baltimore 24, Md.

ATOMIC Fury (Bikini bomb tests) 8mm., 50 ft., $1.75. Kodachrome, $6.50. 16mm., 100 ft. $3.50. Kodachrome, $13.00. Big film catalog, 10c. World In Color, Elmira, N. Y.

HOLLYWOOD films. Color sample, $1.00 (refunded). Catalogs 10c (refunded). Stone, Lunenburg 10, Mass.

UTILITEE Film Adapters use small color film in large cameras. At dealers or 655 North Broadway, Los Angeles 12, Calif.

"BASS says! 38 years of leadership means satisfaction to you! Finest equipment. 8 and 16mm. sound cameras, sound projectors. Bass buys 'em, sells 'em, trades 'em. Satisfaction always guaranteed or your money back! Bass Camera Company, Dept. A, 179 W. Madison St., Chicago 2.

ANSCO Color 16MM—$9.95/100ft.; DuPont-Kinolux Weston 50-40, 8MM—$2.16/25ft., 16MM—$5.40/100ft.; Weston 160, 8MM — $2.16/25ft., 16MM — $5.76/100ft.; Lamps, 750WT12-2/$5.90; 1000WT12-2/$8.90. Postpaid. Bichro Photo, 2876-J Jerome Ave., Bronx 58, N. Y.

33MM SILENT sound films supplies. Bedner 5300 So. Talman, Chicago.

CHILD is born by Caesarean delivery. Project outstanding movie production free. Send postal immediately. Movie Films, Hamilton 21, Ohio.

16 MM MOVIES. Rental, sale—sound, silent. Equipment on Time payment our specialty. Send for free catalog stating your needs in first letter. Institutional Cinema Service, Inc., Dept. P.S., 1560 Broadway, New York 19, N. Y.

LEARN movie projection, management. Free Catalog. Theatre School, Elmira, N.Y.

BARGAINS! Free films, equipment catalog! Towers, 935 North 40th, Philadelphia 4.

BARGAINS in used 16mm. sound films. Cartoons, sports, musicals, features. Big list for stamp. Blackhawk Films, Davenport, Iowa.

SEND 10c for projector, camera, film, etc., catalogue. Sterling's, 679 Northampton, Easton, Pennsylvania.

MAGAZINE 16mm 50' E.K. Super X panchromatic. Guaranteed. Processing included $1.99 postpaid. Circulars Free. Fischer Photo, 1729 N. Mobile, Chicago 39, Illinois.

SAVE $30.00 yearly. Send stamp for details. Bonnie's Film Club, 422 Haven Avenue, Hamilton, Ohio.

MOVIE Cameras! New Lektro junior 16mm electric, magazine-load F3.5 anastigmat lens, battery, cord. Complete, ready-to-operate. Only $59.50. Money back guarantee! Free literature. Panchromatic magazine film for this camera $2.50, free processing. Army-Navy GSAP, original condition, value $200, new $32.50, used $19.50. Other Panchromatic film—25 Ft. double 8mm, $1.65; 100 ft. 16mm, $2.95; includes processing. Fotoshop, Room 96, 18 E. 42nd St., New York City.

WE Buy, Sell, Rent, Exchange Home Movies. Details for dime. Midland, Box 429, Oak Park 3, Ill.

EXCLUSIVE Home Movies Select Films. Write for Free List. Home Pix, 1674 Broadway, New York 19, N. Y.

FILM—Free processing 100 ft. 16mm. Weston 12 $3.25, Weston 24 $4.90, Weston 64 $4.95. 25 ft. double 8mm, Weston 12 $1.50, Weston 24 $1.89, Weston 64 $1.99. Free-Circulars. Promader Genera, Davenport 5, Iowa.

DISTRIBUTORS Wanted. Make big money selling our new sensational films. Send for sample and free wholesale price list. 16mm. sound, $10.00; 16mm. silent $7.50; 8mm. $2.50. Standard Pictures Corp., Universal City, Calif., Dept. B.

"THE World's Greatest Passion Play". All sizes. Rent or Purchase. Write Hemenway Film, 33 Z Melrose St., Boston 16, Mass.

MONEY-Making Roadshow Films. 16mm sound. Top stars. New prints. Low prices. Write! Grand, 2506S 52nd, Kenosha, Wisconsin.

GUARANTEED fresh anti-halo outdoor movie film! Weston 12! Daylight loading! Processing free! Three spools double 8mm, $3.45! Six single 8mm for Univex, $4.60! Postpaid! Catalog. Eso-S, 47th Holly, Kansas City 2, Missouri.

PROCESS your own movie film. Literature. Duro Products, 1519 Eggert, Eggertsville 21, N. Y.

FREE! Subscription offer! Amateur Screen Photography Magazine, 3021B Narragansett Ave., Chicago 34, Ill.

ART model films 16mm rentals exclusively, adults list. Enclose stamp. Revere Films, Box 1051, Detroit 31, Mich.

MOVIE Fans—100' 16mm $2.25. 3 rolls $6.00. magazine film $1.95. Titles 15c. Ambassador. 479-A-Quincy Street. Brooklyn 21. N. Y.

IMMEDIATE delivery of 16mm Sound projectors. Large stock of Castle. Official. Nu-Art and Pictorial films. Soundies Comedies. 16mm Ansco color film. Used 8mm. 16mm Sound. List Titlers. Splicers. Editors. Rewinders. (Home Movies. 41 South Fourth Street. Allentown. Penna.)

SURPLUS 16mm Eastman Super X on 50' cores. 50c postpaid! 12 rolls $5.00! Outdated but tested and guaranteed! 100 camera spools 25c. postpaid! Processing. 75c. Filmcraft. 47th Holly. Kansas City 2. Missouri.

8-16MM ART movies. beautiful models. list free. P. O. Box 103. Malden. Mass.

92 MUSIC, MUSICAL INSTRUMENTS

PLAY piano by ear. A "sound" system. Booklet free. Joe Boucher. Box 128. Ottawa. Canada.

SAMPLE of prices. New cornets with case $39.50. Full size accordions with case $259.50. Spinet pianos $495.00. Trap drum outfits $185.00 etc. If you are a musician. you need our new Showbook catalog. Send 25c for yours today. Harden's Musical Merchandisers. Marion P. Ohio.

POEMS set to music. Experienced composer. Free folder. Moquin. 5333A La Cresta Ct.. Hollywood.

BE Independent. tune pianos. music unnecessary. Practical Piano Tuning shows you how. $2.00 Postpaid. Chord-Slide Co.. Dept. PS. 3122 Lawrence Drive. Corpus Christi. Texas.

MUSIC Harmonization chord chart plus notation shorthand. $1.00. Paul Stackpole. 2110 W. Venango St.. Philadelphia 40. Pa.

MUSICAL movements. $3.00. Free photo. Pevar's. 4218 Viola. Philadelphia 4. Pa.

PHONOGRAPH Records 20c. Catalogue. Paramount. SG-313 East Market. Wilkes-Barre. Penna.

122 SONG WRITERS

POEMS Wanted to be set to music. Free examination. Send poems. McNeil. Master of Music. 510-PS. S. Alexandria. Los Angeles. California.

SONGWRITERS. Songs Published Monthly. Advance Royalty. Send your songs or poems today for our exciting offer. Hollywood Tunesmiths. Dept. 10F-C. 1537 N. Vine. Hollywood 28. Calif.

SONGWRITERS: Send Poems for Free Examination and Outstanding offer. United Music. 116. Salem. Indiana.

SEND your songs. song poems. Hollywood composers write melody Without Charge. Lead Sheets. Records furnished. Send song material today. Free examination. Get details. Cinema Song Company. Dept. B-55. Beverly Hills. California.

LOUIS Terry's Tune Service. 709½ N. Broadway. Oklahoma City. Okla. References. Write for Free booklet.

HONEST outstanding music writing offer. Len-Tex Studios. Leonard 3. Texas.

POEMS wanted for musical setting. Send Poem for immediate consideration. Hamann Service. 626 Manhattan Bldg.. Milwaukee. Wisc.

POEMS Wanted For Musical Setting. Send poem for free examination. Five Star Music Masters. 646 Beacon Bldg.. Boston.

SONGWRITERS—Protect your songs. Get the facts first. Free booklet. attractive offer. Song Service. 331-J West 46th. N. Y.

112 RADIOS, SUPPLIES & EQUIPMENT

MAKE Simple. Tubeless. Batteryless. Distance-Getting Crystal Radios. Crystal and illustrated instructions 25c postpaid. Allen. 427-S. Clinton. Mo.

U.S. Signal Corps Featherweight Earphones $1.00. Radio Service men and experimenters send stamp for our giant radio catalogue. Save dollars. United Radio Co.. (100-V) Newark 1. N. J.

FREE radio and television catalog! Money saving prices on radios. hard-to-get-parts. record changers. wire and disc recorders. amplifier systems. tubes. books. amateur and test equipment. Write today! Radionic Equipment Co.. Dept. 153. 170 Nassau Street. New York 7. N. Y.

D.C. METERS. new 3½". $1.39 each. 5 for $5.00. send for list E2. Boutwell Electric. 203 Gilbert. Kirkwood 22. Mo.

BUILD a Portable radio tube tester; improved design. checks all type radio receiving tubes; complete kit with easy to follow assembly blueprints; saves you $20. Brand new factory parts; Dept. B—Standard Appliance Co.. 1438 West Third Street. Dayton. Ohio.

FM ONLY $9.95! Tuner kit. all parts including walnut cabinet. easy instructions. Marsh Electronics. 6059 Waveland. Chicago.

BARGAINS—Radios. phonographs. kits. supplies. Free list. Al's Radio Service. Sioux City 7. Iowa.

FREE information about the most sensational highly sensitive head phones. All crystal set owners and experimenters should write for it. Radio City Labs.. 30 Church St.. New York 7. N. Y.

MAKE Selective distance getting crystal radios. Also one tube radios. Improved designs. Instructions and crystal 25c. Radio Leader. La Verne 7. Calif.

SAVE MONEY on finest-quality. nationally-known radio parts. electronic equipment. Compact SPDT 110 VAC relay 89c; Famous T-17-B microphone with cable and plug. used but in perfect condition 49c; DACO Counter Model Tube Tester $29.50. Portable Model $32.50; RG-8/U 52-ohm Coaxial Cable. 100 ft. $2.89; Order off this ad! Send 25% deposit. Balance C.O.D. And ask to receive up-to-the-minute bulletins listing latest. greatest buys like these—transformers and chokes 19c—tubes as low as 13c. Mid-American. Dept. CC-11. 2412 S. Michigan. Chicago. Ill.

26 YEARS Experience radio repairing at your fingertips. I've repaired 45.000 radios. Have perfected simple system you can follow step by step. No calculations or formulas. Total price $2.00 postpaid or COD. Moneyback guarantee. Ross Radio. 14615-N Grandriver. Detroit 27. Michigan.

HALLICRAFTERS. National. other radios wholesale. Terms. Write. Henry Radio. Butler. Missouri.

BUILD "loudest" crystal radio. Instructions. Loud crystal: 25c. Amorose's. Route Four. Richmond. Virginia.

RADIO controlled garage door opener. Works from button in car. Complete plans $1.00. Champman. Box 3236. Birmingham. Alabama.

24 PAGE plans "18 Crystal Sets" (SW record 5800 miles). Catalog. "Radiobuilder"—all 25c. Laboratories. Eye-T. San Carlos. California.

SELSYNS. Large. heavy duty. high torque. no overrun. precision made. weight 6 pounds each. $10.95 pair. Radioco. 1110M Marshall Bldg.. Cleveland. Ohio.

GENUINE Western Electric. radar type fixed crystal. highly sensitive 79c. two for $1.30. three for $2.00. Get your supply—scarce—List P. S. 123. Electronic Laboratories of America. Box 394. New York 8. N. Y.

24 BUSINESS OPPORTUNITIES

$25 WEEKLY working two hours daily. No canvassing. No Manufacturing. Lycke. Box 2471. Cleveland 12. Ohio.

OPERATE profitable home business selling merchandise by mail. Fast sellers. Large profits. Powell Service. 5713 Euclid. Cleveland 3. Ohio.

RECAST old batteries into new. Latest achievements. Battery Laboratories. Minneapolis.

SPECIALTY Manufacturing. the big money business that can be operated anywhere. start on a very small capital; we supply dependable formulas and complete instructions; get interesting Free booklet. "Money-making Opportunities in Specialty Manufacturing." Howard Robinson. Pb. G.. 1300-B S. Ohio St.. Sedalia. Mo.

137 PLANS to make money local. mail order. Particulars free. Elite Co.. 220-A Grand St.. N. Y.

GOOD Paying Business Silvering mirrors. plating autoparts. reflectors. bicycles. bathroom fixtures. etc.. by late methods. No tanks or shop required. outfit furnished. Free Booklet. Gunmetal Co.. Ave. E. Decatur. Illinois.

TWELVE Different Spare-Time Jobs. Take your pick. Average $1.00 hourly. Positively no selling. Write immediately. American Business Service. Nescopeck. Pa.

START home business making statuettes. plaques. artificial marble flooring. liquid marble. flexible molds. metallizing baby shoes. Amazing profits. Folder Free. Creative. 236-M. Winnetka. Illinois.

SELL By Mail! Books And Novelties! 35 different items! Large Profits! Catalog free. Elfco. 432 N. Wells. Chicago 10.

COIN Machines earn big money! Machines are now available at $11.75 that can earn as high as $7 weekly profit. Place machines in stores. hotels. filling stations. etc.. and your income starts immediately. Routes can be operated in spare or full time with no experience needed. We'll tell you how and send you a catalogue describing our nut. candy. gum and postage vendors. also scales. amusement games. etc. Write immediately to Parkway Machine Corp.. (Z) 623 W. North Ave.. Baltimore 17. Maryland.

EXCLUSIVE Distributor. Plasticized beauty-protection for auto finishes. Used like polish. Must fin. own stock. Plasticize. 2254 NW 62nd St.. Miami. Fla.

MANUFACTURE Yourself: Cleaners. Polishes. Cosmetics. Formula Catalog free. Kemico. 10. Parkridge. Ill.

TRAVEL anywhere anytime. Earn $85.00 week up. Be your own boss. No experience necessary. Less than $5.00 investment required. Literature free. Traveler. La Grange 2. Indiana.

BIG profits and your own business casting new 1948 Metal Toys and Novelties. Latest scale model Autos. Original Ashtrays. Savings Banks. Water Pistols. etc. Enormous wholesale and chain store demand keeps manufacturers busy. No experience or special place necessary. Write for details and illustrations of patterns needed. Metal Cast Products Co.. Dept. E. 1696 Boston Road. New York 60. N.Y.

DISTRIBUTORS. all territories. new simplified Bookkeeping & Tax System. Many salable features. $16.25 profit each sale. Repeats. Money maker. Opportunities. Exclusive franchise. National Accounting Service. Box PS-3. Lynbrook. New York.

COLORGLAZED Concrete Pottery made without molds. Patented method. Cemetery products. novelties. tiles. Basement leak-sealing. Money-making projects. Booklet. details free. Men only. National Potteries. Grand Rapids. Minn.

A FACTORY in your home garage! Mfg. and sales rights. mechanics' waterless hand cleaner. $500-$800 monthly. No special equipment necessary. Western Aircraft Mfg.. Dept. G. Los Angeles 6. Calif.

AT Home — Your own manufacturing business; making popular $1.00 novelties. Cost you 3c to 15c. Everything supplied. Write So-Lo Works. Dept. C-601. Loveland. Ohio.

START advertising and letter shop. Complete home training. Free booklet. Armstrong Schools. Box 2136. Los Angeles 3. California.

YOUR own plastic business at home. Produce costume jewelry. novelties. statuettes. liquid plastic. liquid marble. flexible molds. Write for free book. American Trades. Box 89-B-4. Cincinnati 39. Ohio.

MEN and women wanted to place self-selling coin machines in stores. hotels. filling stations. etc. New machine earns up to $6.00 weekly—costs only $10.50. We furnish supplies and machines for nuts. gum. candy. stamps. scales and amusements. Free details of tested selling plan. Write Dept. Z. Parkway Machine Corp.. 623 W. North Ave.. Baltimore 17. Md.

DOLLARS to you at home. Write for details. W. A. Jones. Box 395. Upper Darby. Pa.

FOR an extremely profitable lifetime business operate a Collection Agency-Credit Bureau. Easily learned. Free folder. Cole & Associates. Syracuse 2. N. Y.

UNLIMITED Opportunities offered in mail order. Write for details. Klebing. 60-19 60th Drive. Maspeth. N. Y.

GET it for them wholesale. Be Community buyer nationaly known merchandise; radios. refrigerators. washers. sweepers. typewriters. etc.; Savings to 50%. This pleasant easy work can earn to $5000 year. Free details. Robert W. Cox. 14 Church. Saugus. Mass.

MAKE flexible molds! Few cents each! Cast plaques. novelties. bookends! Free sample! H. Tooker. Hamilton 7. Ohio.

START Mailorder Bookshop—Everything furnished. 25c brings booklet. samples. exciting ideas. General Publications. Ossining 1. N.Y.

"MOST everybody likes candy"—Learn to manufacture in a professional manner. (Our 38th year). Ragsdale Candies. #7. East Orange. N. J.

HOW To Set Up and Run A Mirror Shop! Resilver Mirrors. For Price write—John Sprinkle, V90, Marion, Indiana.

MAKE perfume. Complete outfit $7.50. Information free. Lawson, 21 Joiner, St. Augustine, Florida.

RAISE Earthworms. Instructions $1.00. W. Huffman, 391 Pleasant Lake, Rives Junction, Mich.

POPCORN Machines, Potato Chip outfits. Long Eakins Co., 4863 Hi St., Springfield, Ohio.

MANUFACTURE costume jewelry at home for profit, hobby, therapy. Free wholesale supply catalogue. Instructions. Florida Supply House, Bradenton, Florida.

QUICK Money! "Repairing Car Batteries." At home! Easy too! Write, Batteryman, Grand Junction 1, Colorado.

CLASSIE Novelty, large profits dime. Martin, PS, 57 Hart, New Britain, Conn.

ANALYZE Handwriting, fun "profit", popularity. Complete outfit 50c. Satisfaction guaranteed. Graphology Institute, Box 1251-B, Louisville 1, Ky.

MAKE Profits in mail order business. Astounding plans describing method sent free. Jimton Service, Lock Box 1373-H, Mobile 8, Alabama.

START Your own electroplating business, highly paid, uncrowded field. Learn at home in spare time. Send postcard for free electroplating booklet and proof. Plater-Hyde, Room 523, 432 "F" Street, San Diego 1, California.

WOULD you pay 3%—first $350 made? Color-illustrated book "505 Odd, Successful Enterprises" free! Some offer occasional "day off." Work home. Expect something odd! Pacific, Oceanside, Calif.

INCOME from local information. No selling. Neher Co., LaVerne, Calif.

MAKE money spare time, write today. American Letter, New Market 1, N. J.

MAKE Perfume, profitable, sparetime, home, business. Men, women, write "International," 6347 Parnell-S17, Chicago 21, Illinois.

MAIL Order businesses, bought, sold, brokered. Write for Free bulletin of exclusive opportunities. Turnipseed, Inc., Box 681, St. Louis, Mo.

ELECTRICALLY Inclined men. Amazing illustrated literature free, proving $100-$250 weekly possible installing, maintaining fluorescent lighting. Rebuild fixtures for excellent profits. Make beautiful lights for 50c each and less. Free sample materials. Write Willis Fluorescent Service, 101 York Street, Brooklyn 1, N. Y., Dept. A.

WHITE Liquid Rubber for making flexible molds! Quick drying! Safe! For home, classroom, or industry! Quart $2.00, Gallon $5.95. Full instructions! Beginners booklet on molding and plaster casting 25c. Free with order! Plastercraft Supply Company, 1406 East 43rd Street, Cleveland 3, Ohio.

START Home plaster novelty business. Amazing course tells how. Literature free. Kemo-Courses, 4862 Catalpa, Chicago 30, Ill.

METALLIZING Baby Shoes makes you money! Learn this simple, profitable business from nationally recognized authority. Little investment—large returns! Get professional "Know-How"! Free details. Joseph B Kushner Metal Finishing Engineer, Stroudsburg 33, Penna.

LIQUID Rubber for making flexible molds. Cast novelties. Sample bottle 25c, free literature. Chaney, 1130 E. 16th St., Jacksonville 6, Fla.

HANDYMEN—Earn money home operating Community "Fix-it" Shop. Write Stafford, 708 Rawlings, Carbondale, Ill.

MACHINES available for making new designs of interlocking concrete building blocks. Delaware Industries, Dept. 21, Muncie, Indiana.

$126.50 GUARANTEED weekly. Mail $1.00 deposit. Stannette, 277 Madison Street, New York 2.

OPERATE home business that may mean the road to independence. Write, Sunray, 4756-B N. Bernard, Chicago, Illinois.

DON'T GUESS OR WONDER ANY LONGER about what to sell by mail. Sell Names. Right methods, successful ideas bring large profits. Write, Milton T. Clements, Pinellas Park, Florida.

BUYERS Wanted for plaster novelties and religious statuary. Painted—unpainted, retail—wholesale. Write today for free information. Bing Products, 88-B4M Broad, Boston 10, Mass.

SALESMAN; nice profits selling costume jewelry. Dime brings literature, prices (refunded). Master Makers, P. O. Box 207, Dubois, Pa.

SAVE! Million articles wholesale. Directory 10c. Publisher, Box 1302-A3, Detroit 31.

EARTHWORMS—For Soil Building & Better Composting. Write for free booklet. Coolville Earthworm Farm, Coolville, Ohio.

OPERATE profitable mail order business. Write Walter Service, 4159-B East 112th, Cleveland 5, Ohio.

ELECTROPLATING Has a thousand and one uses. Make good money in spare or full time. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free sample and literature. Warner Electric Co., Dept. OB-P3, 1512 Jarvis Avenue, Chicago 26, Ill.

HOW and Where to obtain capital. Particulars free. Star Service, Wapakoneta, O.

GET it for them wholesale. Be community buyer nationally-known merchandise: radios, refrigerators, washers, sweepers, typewriters, etc. Savings up to 50%. This pleasant easy work can earn up to $5000 year. Get details today. Kraft, Aurora 9, Mo.

FREE Booklet, entitled "Collect And Grow Rich." Learn of this opportunity for a life-time, spare or full-time business of your own where you can make a profit on the work of thousands of others. T. J. Surface, Pres., Dept. 217-C, Roanoke 7, Virginia.

LEARN to publicize yourself for increased income in your business or profession. Details free. Publicity Systems (PS), Box 322, Jacksonville, Illinois.

$46 FROM Square Foot Plywood; Jigsaw necessary. Write; Woodart, Bridgewater, Mass.

BE Your own boss. Metallize baby shoes. At home spare time. Schwieger, 8404 West Chestnut, Wauwatosa 13, Wis.

BABY Shoes preserved. Formulas, Instructions $1.00. Supplies & Bases, Novelty Bronzing, Box 56, Hyde Park 35, Mass.

COIN-operated Popcorn machines $110. Write Box 712, Corsicana, Texas.

AGENT or exclusive distributor for cigarette lighter mfg. MacGregor, Tahoe Valley 15, Calif.

"MONEYMAKING opportunities" in mail order. Write immediately. Wayne A. Burger, Baltic, Ohio.

GENUINE Natural Latex for rubber molds. Only two coats necessary for thick mold. Make money reproducing statuary, plaques, novelties. Low cost. Write Major Chemical Company, 131 Inman Street, Cambridge, Mass.

BOOKKEEPERS — Accountants develop your own profitable business posting journal entries for small businesses in your locality. Full or spare time. Write National Bookkeeping Service, Midland Building, Kansas City 6, Missouri.

FOR more business, operate an individual business office, exclusively under your own name. Rates $7.30 and $14.60 yearly. Cooperative Office Service, 126 Lexington Avenue, N. Y. 16.

GET Hundreds Money Making Deals, business ideas, plans and manufacturing. Amazing folio free. Austin Mail Service, 5538 Lexington, Chicago, Ill.

MAILING postcards selling repeat merchandise is profitable. Everything supplied. Details free. Gordon Publishers, Box 23, Pawtucket, R. I.

RUBACREAM! Natural Rubber Latex! Makes molds quicker! Thicker! Free Sample convinces! Castcraft Studios, 509-S Fifth Avenue, New York 17.

TYPEWRITER Repairmen urgently needed. Earn $40 to $50 weekly spare time. Our easy to learn home study course teaches how to repair typewriters. Write for free information. Houston Typewriter Repair Service, P.O. Box 5357, Houston 12, Texas.

START a clock shop while clock repairing is booming. Our easy to learn home study course with pictures and illustrations teaches you how to repair all kinds of clocks. Information free. Houston Clock Shop, P.O. Box 5086B, Houston 12, Texas.

MAKE Rubber stamps, metalize baby shoes, silver mirrors. Make plaster novelties. Catalogue of "20 Ideas" Free. Universal, Box 1076-B, Peoria, Ill.

PRESERVE baby shoes. Gold, Silver Bronze. Instructions $1.00. Johnson, 2611 Harriet, Minneapolis 8, Minnesota.

BE an Employment-Intermediary Agent; Extremely profitable. Simplified method. Hunt Associates, Burlingame 2, Calif.

NATURAL molding latex. Extra thick. Free sample. W. Wooley 115-B Donald, Peoria, Ill.

SPECIAL Rubber for making molds. Literature and sample free. Universal, Box 1076-B, Peoria, Ill.

FLEXIBLE Molds to order, also originals. Professional course manufacturing molds and cast novelties. Latex, lacquers, flocks, flocking equipment, supplies. Plastics, Box 1574, Boston 4, Mass.

HOME Workers wanted to hand-spin Angora Wool. Either Sex. House of Angora, S3, Springfield, Ill.

BIG Money In Vending Machines—Smallest capital start brings immediate profits that build permanent profitable business. Starting instructions free. Becker Vendors, 105-P Dewey, Brillion, Wisc.

LIQUID Marble—colorful, glossy! Mold, brush, spray. Plastic ivory, flexible molds, composition floors. Particulars free. Marbleizing Service, Edwardsville, Illinois.

WATCHES. Wholesale. Rebuilt-like-new Elgins, Walthams, Bulovas, Etc., $9.75 up. Catalogue free. Brookings, B-W1975, Little Rock, Ark.

BUY wholesale—Retail quantities—Details stamp. Wisuri, 10-A Railroad, Maynard, Mass.

SAWDUST. Turn it into cash. Six methods. Instructions 25c. Charles, 12-EM, Norwood, Ohio.

TYPISTS. Profitable business at home. Complete copyrighted information. 50c. Gaunt, 3521-G Broadway, Chicago 13, Ill.

EXTRA Money in your pockets. Steady profit. Make-sell specialty products. Tested products and sales plans. Complete treatise $1.00, particulars free. Karamus Products, Dept. 10, Linden, N. Y.

NO selling, operate vendors, amazing profits, details Free. Factory Silver-King Corp., 622 Diversey, Chicago, Ill.

PERMANIZING trade, bookend moulds, bronze. Dodge Studio, 37 Gravel St., Meriden, Conn.

FIFTY new vending machines. Bargain. J. Labardee, 1200 Beard, Detroit 9, Mich.

MECHANICALLY inclined? Resurface butcher blocks. Lifetime business. Roy Crawford, Keyport, New Jersey.

UNPAINTED Marbilite and plaster ornaments. Easily painted. Free list. Bijou Novelties, 444 Avenue T, Brooklyn 23, N. Y.

BATTERY repairing, rebuilding plans $1.00. L. Wertz, Pekin, Ill.

88 MONEY MAKING OPPORTUNITIES

ELITE Collection describes 137 money-making plans; local, mail order. Particulars free. Elite Co., 220-A Grand St., N. Y.

DETECTIVES Earn Big Money. Experience unnecessary. Particulars free. Wagoner, P-125, West 86th, N. Y., N. Y.

SEWING Machine Repairmen make big money lifetime. Start neighborhood shop. Complete repair manual, covering all makes. $1.98 postpaid. Money Back Guarantee. Sewmachine Serviceman, Hamilton 10-L, Ohio.

METALLIZE baby shoes. Further information — 3c stamp. Metal Crafts, Box 125-R5, Tampa 4, Florida.

JOIN moneymakers club. Many mail order and home work plans. Six month service 10c. Lewis Service, 828-S, Carpenter, Oak Park, Ill.

"WHOLESALE Buyers Guide" (copyrighted) articles wholesale 32 pages. Dept. A, Snook Specialties, 188 N. 21 Street, Battle Creek, Mich.

START profitable business. Manufacture Plastex novelties. Bava, 3655 East Canfield, Detroit 7, Michigan.

BIG money manufacturing floor tiles. Details free. U-Build-It Service, 206-A West Wilder, Tampa, Florida.

MANUFACTURE costume jewelry at home for profit, hobby, therapy. Free wholesale supply catalogue. Instructions. Florida Supply House, Bradenton, Florida.

WOULD You pay 3%—first $350 made? Color-illustrated book "505 Odd, Successful Enterprises" free. Expect something odd! Pacific, Oceanside, California.

READ "The Hamster Manual". Learn everything about the new money-making wonder animals from Syria. Tells where to buy and sell these delightful animals. Beautifully illustrated. Copy. $1.00. Albert F. Marsh, 1516 Basil, Mobile, Ala.

MAKE money paint wall, plaques, book ends. Big profits. We furnish plaques at cost. Marblite, Ames Box 53, Omaha, Neb.

"THERE'S Big Money In Junk," and repairing Car Batteries! Batteryman, Grand Junction, Colorado.

MAKE Perfume, profitable, spare time, home, business. Men, women, write "International," 6347 Parnell-S18, Chicago 21, Illinois.

EXTRA Money? Free details. Trable, 1018½ Elm Street, Dallas, Texas.

WIN Contest money, send 25c guaranteed instructions for writing winning answers. Winacontest, 22 Westlake Ave., Auburn, N. Y.

"WHOLESALE catalog. (Illustrated-10c)" Bargains galore. Stafford, Box 5211, Indianapolis, Ind.

NEW opportunities for you. Stamp brings details. "Charlie", Patchogue, N. Y.

HOME business plans, golden opportunities. Holm, 12B Oaklandon, Indiana.

ELECTROPLATING Has a thousand and one uses. Make good money in spare or full time. Warner Electroplaters permit you to easily plate chromium, gold, silver, nickel, copper, etc. Plating equals costly commercial jobs. Pay for your electroplater in a short time by plating for others at a profit. Write today for free sample and literature. Warner Electric Co., Dept. MO-P3, 1512 Jarvis Avenue, Chicago 26, Ill.

WIN contest money. General Contest Magazine gives hundreds of tips. Lists current contests and rules. Sample 25c. General Contests, 1609-A East 4th, Duluth, Minn.

EARN Money evenings: copying and duplicating comic cartoons for advertisers. Adservice, Argyle (2), Wisconsin.

I AM a preacher, nevertheless made over $2300 in 30 days honestly, legitimately. Others can do as well. Details $1.00. This is not a gag. F. J. Winder, 4638 N.E. 34 Avenue, Portland, Oregon.

START your own business! Big money manufacturing novelties, plaques, statuary. Free catalog. Write Bing Products, 88-B4N Broad Street, Boston 10, Mass.

A $100-a-Month hobby at home! No soliciting, no mail order, no meeting people. Easy, enjoyable pastime. Details, 25c. (Refundable.) Laura Dickson, 808-PS Elizabeth St., Anderson, S. C.

FREE literature describing 137 proven money-making plans. Reiss, 3017-D Ocean Parkway, Brooklyn 24, New York.

UNPAINTED Plaster Ornaments: Beautiful designs, easily decorated with water colors or oil paints. Profit or Hobby. Illustrated List Free, distributors of New Loxite, A Firestone Product, for Molds. Midwest Novelty Mfgrs., 108 Cedar, Anaconda, Montana.

ELECTRIC Clocks are everywhere you go, buildings, homes, parking-lots, factories. Repairs increasing. Our easy to learn course with pictures and drawings teach You how to repair these clocks. Electronic Supply Co., Box 2350-B, Houston 1, Texas.

PRIZE Contest Fans Reap Rich Rewards. Enclose 3c stamp. National Contest Bulletin, Box 2685-S, Miami 31, Fla.

24 FORMULAS $1.00. $76.00 weekly addressing envelopes. Instructions included. Cy, 2233 Eastern Ave., Indianapolis 18, Ind.

BIGGEST 25c value ever Offered! Three big issues "Opportunities Frefered", greatest Business Building Magazine published; plus Big, Dollar Idea "Reference Directory" Book—$1.75 value, only 25c! Hurry! Coates, Publisher, Box 88, Dorchester, Mass.

START Home Mail business! Takes only few dollars. No experience—good earnings. "How Folder," free! Shutt, Box 269, Newcastle, Indiana.

INCREASE Your earnings! Local business opportunities; Mail order information! Wholesale supply source; Valuable money-making tips; Information. Free details, rush name! Wilkin Company, Hillsboro 2, Ohio.

MAKE steady income with alarm clocks. Free booklet. Thies, Genoa 5, Illinois.

MECHANICALLY inclined? Resurface butcher blocks. Life-time business. Roy Crawford, Keyport, New Jersey.

59 FORMULAS, PLANS, ETC.

137 MONEY-making plans, also formulas for salable products. Descriptive booklet free. Elite Co., 230-A Grand St., N. Y.

10,000 FORMULAS and Trade secrets. Free Literature. Stillmans, 555 Kingston Ave., Brooklyn 3, N. Y.

SYNTHETIC Gold. Etc. Atomic—count principle—formulæ $1.00. Box 1329, Long Beach, Calif.

REAL manufacturing formulas. Lists free. Cumming Chemist, Gordon Avenue, Syracuse 4, N. Y.

LABORATORY tested formulas. Any formula, $1.00. Pont, Box 635-A, Terre Haute, Indiana.

READ "Strictly." A "Must." Over 35 new moneymaking formulas, plans. Ads and circulars cannot explain. 50c "Nuf Sed." Circular free. Teycer, Chemist, Box 1287¾, Chicago 90.

106 PLASTICS

PLASTIC—Sheets, Rods, Tubes, etc. Free List. Plastic Supply Co., 2618 St. Louis Avenue, St. Louis 6, Mo.

LUCITE, Plexiglas. All size sheets. Cost square foot (12 x 12) 1/16" 90c; ⅛" $1.16; 3/16" $1.43; ¼" $1.68; 5/16" $2.09. Include 10% postage. Almac Plastics, 230 Fifth Ave., New York 1, N. Y.

10 ENTIRELY new ideas, plastic projects, $1.00. Designers Group, Box 363, Pleasantville, New Jersey.

FABROS Pre-fabricated plastic kits and supplies. Sample kit 50c. Catalog free. Fabros, Box 156, Station F-2, Buffalo 12, New York.

INTERNAL carved swans, bluebirds, goldfish, butterflies, etc., pins, $1.50; 2½ x 2½ x 2 paperweights, $2.50; roses costume jewelry sets, $1.50 less findings; 2 x 2 x 2 paperweights $2.00. Crystal, Floral Novelty Co., Somerville, New Jersey.

INTERNAL Carved earrings and necklace ready to wear $1.75 set. Carving drills, dyes, Jewelry finding, tools, Plexiglas, masked sheets 12" x 12" 1/16"—$1.00, ⅛" $1.25, 3/16" $1.55, 14" $1.85. Include 10% postage. Rods, tubes, dyes, cements, buffing, compounds. Free listings. Craft Plastics, Somerville, New Jersey.

NEW Liquid plastic. Clear, colors. Cast without heat. Embed flowers, insects, coins. Saw, drill, carve. Manual tells how. Send $3.50 (West Coast, Canada, Mexico $3.75) for complete 20 project kit including one pound liquid Castolite. Castolite, Dept. C-42, Box 211, Kenilworth, Ill.

FORMALIN for lustrous color-castings. Complete line plastics casting supplies. Free literature. Sample kit $3.00 F.O.B. Formalin, Romeo, Michigan.

PLASTICS—Sheets, rods, tubes, all colors; dyes, supplies; findings. Illustrated fabricating manual, prices, 10c. Lucite sample, 35c. Gem-O'-Lite, Box 686G, North Hollywood, Calif.

INTERNAL Carving outfit, $2.00! (tapered drill, 4 x 2 x ½ "Lucite," cylindrical cutter, coloring enamel, bulletins), Technicraft, 1156 Commonwealth, Boston 34, Mass.

33 CHEMICALS AND APPARATUS

CHEMICALS-Lab. Supplies New Catalog 10c. Mel-Glo Chemical Co., 258 Fourth Avenue, Brooklyn 15, N. Y.

LUMINOUS Paints will glow in dark. Six colors. Fairmount Chemical Co., 136 Liberty St., New York City 6.

LEARN Chemistry at home, from the House of Winn. Home of Supplies for student Chemists. New idea chemical and apparatus outfits for Home Experimenting. Semi-Professional Microscopes and accessories. Send 10c for retail catalogue. Established 1931. John H. Winn, Dept. 603, 124 West 23rd Street, New York 11, N. Y.

SINKER molds for making your own sinkers. Several styles, many sizes. Free illustrated folder. Reading Instrument Co., Box 78, Reading, Pa.

CHEMICALS and apparatus for industrial, analytical, and private laboratories. Complete supply service for correspondence school students. Send 10c for catalog. Dept. M-26, Biological Supply Co., 1176 Mt. Hope Ave., Rochester 7, N. Y.

FREE catalog: Chemistry, Mineralogy, Biology, Physics. Tracey Laboratories, Evanston, Illinois.

SOMETHING special! 24 different chemicals neatly bottled, shipped anywhere within Continental U.S.A.—only $3.50. Met & Co., 160 Hillside Avenue, Nutley, N. J.

COMPLETE Supply Catalog, 10c. Pilgrim Chemical, 348-DD Edith, Salt Lake City 4, Utah.

NEW Laboratory supply catalog of chemicals and apparatus. Contains many thousands of items with illustrations. Send 25c. Standard Science Supply Company, 1232 N. Paulina St., Chicago 22, Illinois.

CHEMICALS, ounce quantities, apparatus, catalog 10c. Fleischer's Laboratories, Everett 49, Mass.

CHEMISTS!!! The Celtic Chemical Company offers you high quality chemicals and apparatus at unbelievably low prices. Enclose $.10 for your catalog. Celtic Chemical Co., 2619 Ocosta Ave., Cincinnati, Ohio.

INTERESTING catalogue, rare elements, chemicals, small quantities process. Vicar Laboratories, Established 1916, Guerneville, California.

68 HELP WANTED

SALESMEN: Big money showing building owners sensational product; cuts essential repair cost up to 75%. Six average orders weekly pay you over $190.00. Age: 30 or over. Get moneymaking facts. Write, Zone Co., Dept. C-8, Box 789, Ft. Worth 1, Texas.

BOYS Wanted. Over $50 week! Sell name plates for front doors. Write National, 214-R Summer, Boston, Mass.

RELIABLE man with car wanted to call on farmers. Wonderful opportunity now. $15—$20 in a day. No experience or capital required. Permanent. Write today. McNess Co., Dept. 40, Freeport, Illinois.

FOREIGN Employment!? List of 70 companies with foreign interests $1.00 or COD. Foreign Service Institute, Box 3934, Miami 24, Fla.

EARN Up to $520 month part or full time keeping books for small firms. Simplified system. Write Tax-Saver System, Dept. C, Ft. Worth, Texas.

5 AGENTS WANTED

GOOD Paying Business Silvering mirrors, plating autoparts, reflectors, bicycles, bathroom fixtures, etc., by late method. No tanks or shop required, outfit furnished. Free Booklet. Gunmetal Co., Ave. G, Decatur, Illinois.

LICK After-war layoffs; Start own business; home, office. Booklet describing "Collection of 127 Tested Plans" free. Elite Co., 220 Grand St., New York.

AGENTS. Sell finest Food Products direct to homes. Successfully sold for 25 years. Big profits. Powerful combination sale plans make sales easy. Permanent repeat business. Samples furnished. Live territories open to Distributors. Mother Hubbard Products Co., 4139 Grand, Dept. PS, Chicago.

EXCELLENT Sideline for printing and advertising salesmen. Decalcomania name plates in small quantities. Great demand. Also make money with our line of Automobile Initials and Sign Letters. Free Samples. "Ralco", XL-Roxbury, Boston 19, Mass.

AGENTS—Big Line Including Food Products. Fast selling premium and bargain deals. Low prices. Send card for big outfit offer with gift. Ho-Ro-Co., 2726 Dodier, St. Louis 7, Mo.

SCHOOL Seniors—Earn 40% commission selling classmates America's most beautiful Graduation Name Cards. Largest selection. Outsells all others. Send for free sample kit. Printcraft, 1425 E. Elm St., Scranton 5, Penna.

MAKE More Money selling personal initialed individualized belts, buckles, cap badges, tie holders. 2000 emblems to choose. Big profits, whole or part time. Write today special outfit offer. Hookfast Specialties, Box 1425, Dept. 7, Providence, R. I.

SELL Delicious Candies, Nuts, Gum. Immediate delivery. Write Casterline, 2031-SF Sunnyside, Chicago 25, Ill.

AGENTS—300% profit selling genuine gold window letters; stores and offices. Free samples. Metallic Letter Co., 437 N. Clark, Chicago.

GOLD lacquered Window Sign Letters. Large Sizes Penny Each. New Foils. Absolutely Beautiful. Free Samples. Atlas, 544 W. 79th, Chicago 20.

A DRESS yours with every 3 you order for yourself and family. Amazing new bonus plan. Everything Free. Harford Frock, Dept. K-9129, Cincinnati, Ohio.

JOBS Open In Selling! Send name, address for Free copy Opportunity Magazine, listing hundreds of companies who need men now, full or spare time. Experience not essential. Opportunity, 28 E. Jackson, Dept. 15, Chicago 4, Ill.

FREE Sample! Big profit opportunity with amazing Glow-In-The-Dark house number, switch plates, pictures, decals, religious articles. Represent large manufacturer. Madison Mills, 303 4th Ave., New York, N. Y.

CALL On Friends With Greeting Card assortment, birthday, get-well, others. Floral stationery. Gift wrapping. Big profits. Experience unnecessary. Samples on approval. Wallace Brown, 225 Fifth Ave., Dept. C-4, New York 10.

FREE! Big box actual full size packages foods, groceries, home needs, sent fob factory. Try them at home and show friends. World beating money making opportunity. Write Zanol, Richmond St., Dept. 6091-C, Cincinnati 3, Ohio.

STARTLING, sensational combination flourescent desk lamp and photo frame. Easy seller. Big profit. E.C.A., 2518 W. Montrose, Dept. P, Chicago 18, Ill.

AMAZING new zipper shoe sells on sight. Big cash profits for salesmen. Leads line 200 splendid styles. Territory open. Get Free sample outfit. Write Victor Thomas, Dept. V-26, Chippewa Falls, Wis.

SILVER cleaning, plating, polishing, liquid (NuSilver). Apply with cloth. Renews silverplated ware, articles, pieces. Silverplates brass, copper, bronze. Female, male, agents wanted. Part or full time. NuProcess Products, Aurora, Illinois.

BE independent, run your own magazine order business. No capital, no experience needed. Helps furnished. Opportunity unlimited. Send today for Free wholesale catalog. McGregor Magazine Agency, Dept. 13, Mount Morris, Illinois.

AMAZING offer—$25 is yours for selling fifty $1.00 boxes of entirely different, new DeLuxe all-occasion cards. Each box sells for $1.00, your profit 50c. It costs nothing to try. Write today for samples. Cheerful Card Co., Dept. 271, White Plains, N. Y.

BUILD your own local shoe business. No investment. Free outfit starts you. Advance commissions plus bonus. Amazing comfort features. Tanners Shoes, 223 Boston, Mass.

$1 STARTS you in business. Sell DeLuxe ties, 100% wool interlining. Costs you only $7 per dozen, you make $5.00 dozen. Send $1.00 for special introductory offer two DeLuxe ties. Catalog complete line Free. Philip's Neckwear, 20 West 22nd St., Dept. P-20, New York 10.

EARN money quickly, easily, showing Greeting cards, stationery, wrappings, many unusual items. No experience. Up to 100% profit. Send today for everyday assortment on approval. Free display folder. Thomas Terry Studios, 200 Union Avenue, Westfield, Mass.

SCHOOL seniors!!! Your postal will bring our wonder, Kwick-Sell cardalog of popular Graduation name cards. Biggest profits $!!! Only firm giving free souvenir chest and card case. Don't miss out! Hurry that postal!!! Craftcards, Box 235 (M), Pittsburgh 30, Pennsylvania.

QUICK extra cash. Sell value plus greeting cards. New 1948 line. 30 boxes retailing 60c to $1.00 each. "Flower-of-Month" and initial stationery, first name imprinted remembrance notes. Profits to 100%. Extra bonus. Special offers. Write today for feature all-occasion samples on approval and free name imprinted. Floral stationery sample portfolios. Elmira Greeting Card Co., M-56 Elmira, N. Y.

LOOK Here! Wanted—men to start in business on our capital. Sell some 200 farm-home products. Thousands our dealers now make quick sales, big profits. For particulars write Rawleigh's, Dept. C-192-PSC, Freeport, Ill.

AGENTS wanted for Tiresignal. Fast selling device. Eliminates flat tires on automobiles. Sample $1.00. Tiresignal, Dept. B, P. O. Box 1667, Los Angeles 28, Cal.

STRANGE "Dry" window cleaner. Sells like wild. Replaces messy rags, liquids. Simply glide over glass. Samples sent on trial. Kristee 119, Akron, Ohio.

SELL New—used clothing from home, auto, store. Men's suits $1.17. Leather jackets 85c. Overcoats 62c. Dresses 17c. Ladies' coats 38c. Other bargains. Catalog free. S & N, 565A, Roosevelt, Chicago.

EASY! Fascinating! Profits to 100%. Bonus. 31 new greeting card boxes 30c up. 5c and 10c individual cards, stationery. Request free name imprinted and floral stationery samples, free 32-page catalog and $1.00 all occasion assortment on approval. Special offers. New England Publishers, North Abington 103, Mass.

SCHOOL Seniors: Sell classmates superb Craftcards for super profits. Write Craftcards, Box 235 (AH), Pittsburgh 30, Penna.

DEALERSHIPS. Sweetline No-Rub Refinish, revolutionary cleaner-polisher. Instantly cleans, renews, leaves high gloss finish on hard surfaces without rubbing. For factories, stores, hotels, banks, theatres, restaurants, lobbies, bars, etc. Repeat sales. Utilized by Army, now available generally. H. C. Sweet Co., 3727 Fenkell, Detroit, Michigan.

POCKET perfume atomizer. Beautiful. Streamlined. Retails $3.95. Your profit 100%. Sample $2.00 prepaid. Every type store a prospect. Crafts, 1121 Penn Ave., Pittsburgh 21, Pa.

PROFITS to 100% selling everyday greeting card assortments. Details and assortment on approval. Glorian, Dept. 20, 515 East 45th Street, Brooklyn 3, New York.

EXTRA money fast. Sell friends exclusive greeting cards, stationery not obtainable elsewhere. 37 boxes. Profits to 100%. Bonus. Quick selling everyday, birthday gift wrapping assortments; exclusive name imprinted, engraved name stationery. Write for free stationery samples and all-occasion samples on approval. Special offers. Regal Greetings, 19 W. Woodruff, Dept. PS, Hazell Park, Mich.

AT last! Something new and sensational in Everyday Cards. New, gorgeous satin and velour designs. Get orders fast. Big profits. Imprinted stationery. 14 assortments for year 'round occasions, retail 60c to $1. Get samples on approval. Puro Co., 2801 Locust, Dept. 841-C, St. Louis 3, Mo.

SELL advertising booklets, service stations, garages, free literature. Ruberta, Carthage, Ill.

DEALERS Wanted to sell fishing tackle, lawn mowers, electric drills. Teresi Jobbing, 1703 Olson Hiway, Minneapolis 5, Minn.

INFORMATION — Wholesale supply sources. Moneymaking plans. Increase your income. Write Reynard Service, Smithfield 3, Ohio.

ADVERTISING book matches—Cash in on Political campaigns—sell Union Label matches. Cuts for all businesses and political parties—Free powerhouse selling kit—low prices—protection guaranteed on repeat orders—Cash commissions. Superior Match Co., Dept. P 38, 7530 Greenwood, Chicago.

AGENTS Wanted for our Slot Machines and coin operated amusement games in every town and community. Sell to clubs and homes, or start a route. Webb Distributing Co., Dept. P40, 6 So. Kedzie Ave., Chicago 12, Ill.

MAGIC Cleaner and laundry soap deal. Hotter than a firecracker. Big Profits. Sample free. Uko, 5007 Irving Park, Chicago.

AMAZING screw holding screw drivers! Remove, hold, insert screws inaccessible places! Exclusive distributor; factories, stores buy quantities. Millen Mfg. 799, Miller Bldg., Boston, Mass.

MORE Money—Quick. Big profits to 100%. Bonus. Show friends complete line greeting cards, gift wrappings, stationery. Experience unnecessary. Send today for free samples Name Imprinted, Floral stationery and money making new 1948 feature all-occasion box on approval. Special offers. Tom-Wat Studios, Dept. PS, Bridgeport, Conn.

WHOLESALE! Balloons — Novelties — Watches — Jewelry — Premium Goods. Collins Co., Forsyth 2, Georgia.

WOULD you pay 3%—first $350 made? Color-illustrated book "505 Odd Successful Enterprises" free! Proven! Work at home, office. Expect something odd! Pacific, Oceanside, California.

MAKE Perfume, profitable, sparetime, home business. Men, women write "International," 6547 Parnell-S19, Chicago 21, Ill.

MAKE MONEY AT HOME LIKE I DO! Write immediately. Duff, Covington 5, Ky.

POCKET Pal: Replaces pocket knives. New, safe, beautiful. Always razor sharp. 50c seller. 231% profit. $15.00 or more daily. Agents, salesmen, distributors. Nelson Manufacturing Co., 222 W. Kellogg, St. Paul 2, Minn.

"IDEAL business stamping metal key protectors, social security plates. Information upon request. General Products, 11 No. Pearl (PS), Albany, N. Y.

BIG easy profits. Sell friends famous Wear Wright nylon hosiery, lingerie, blouses, sportswear. Free sample display cards. Complete line greeting cards. Samples on approval. Special offers. Wear Wright Company, 1709 Arch Street, Dept. B, Philadelphia, Pennsylvania.

FOWER MOWER—$99.50 (Maytag Engine). Sensation. Agents, dealers. Rotacut, M-2013 Excelsior Springs, Mo.

$3 FIRE Extinguisher sells wholesale or direct. "Fire-Killer", 101 Franklin, Syracuse 1, New York.

NO Money or experience needed. Spare or full time. Steady income writing orders guaranteed men's hose. Variety 20 styles. We deliver and collect. Liberal advance profit, 33% cash bonus. Write today for complete free sales outfit. Kentcraft, Dept. CS, 44 Court St., Brooklyn 2, N. Y.

FREE nylons given if Kendex hosiery runs or snags! World's only women's hosiery sold with a written guarantee that amazes everybody! Free replacements made regardless whether runs caused by use or abuse. Here is sales dynamite that will blast your earnings to the sky. Even if you never sold a thing in your life, three magic words: "Guaranteed Against Everything" is enough to make women eagerly buy. No money or experience needed. Penny postcard your only investment. Just write orders. We deliver and collect. Liberal advance cash profits plus huge cash bonus. Complete line includes three lengths, sheer and service nylons; regular and extra long rayon. Complete money-making sales outfit free and prepaid. Rush name and address today and start next week making more money than you ever thought possible. Kendex Co., Dept. 117, Babylon, N. Y.

SELL Ultra blue stock signs to stores. 1000 slogans, comedy, general, religious. 7 x 11, cost 6c, sells 35c. Make money. Sample free. Lowy, 8 West Broadway, Dept. 328, New York City (7).

MAKE more money selling personal initialed individualized belts, buckles, cap badges, tie holders, 2,000 emblems to choose. Big profits, whole or part time. Write today—special outfit offer. Hookfast Specialties, Box 1425, Dept. 7, Providence, Rhode Island.

FAST Selling Carded Auto Accessory and Other Items, write Steele Plastics Co., Ashland, Ky.

$200.00 WEEKLY Selling Prophylactics cost 50c dozen—$4.00 gross lots sells $1.00 dozen. Service Wholesale Company, 603 Brooks St., Charleston, W. Va.

EVERYBODY'S feet hurt. Sell guaranteed relief. 100% profit. Excellent repeater. IDI, Quakertown 2, Penna.

REVOLUTIONARY Products! Thousands prospects everywhere. Men earning up to $250 week. Placed on free trial—sells itself. Orders financed by factory. Territory available. Special Demonstrator Offer. John Wilson, 2433 Indiana Ave., Dept. 329, Chicago 16, Ill.

SELL!! Balloons, Combs, Specialty Merchandise. Carleton House, Distributors, Texas City, Texas.

SELL Brilliant new Curv-O-Syns, any copy, one price. Callas Company, 2832 Hamilton, Detroit 1, Mich.

DISTRIBUTORS—Increase your income! Wholesale supply sources. Moneymaking plans. Write Bowden Service, Box 0673, Toledo, Ohio.

69 HIGHGRADE SALESMEN

EARN $25 a day and more selling nationally advertised aluminumware, silverware, pressure cookers and jewelry. It is simple, let us show you how to make big profits with no investment. Write Continental Products, Dept. C, 30 Ormsbee Avenue, Providence, R. I.

AMAZING discovery. Master Glaze, puts brilliant glass-like surface on cars. Free sample, information. Big commission. Master Glaze, Dept. 642, 7720 Harwood, Milwaukee, Wisc.

START Your own business on our capital. Always your own boss. Hundreds average $6,000 to $25,000 annual sales year after year. We supply stocks, equipment on credit. 200 home necessities. Selling experience unnecessary to start. Wonderful opportunity to own pleasant, profitable business backed by world-wide industry. Write Rawleigh's, Dept. C-U-PSC, Freeport, Ill.

MEN wanted at once. Full or part time. Just send name, address for free copy of Specialty Salesman Magazine giving hundreds of immediate openings with reliable firms. Sales experience unnecessary as we also send free 42 page book telling how. Specialty Salesman Magazine, Dept. PS-13, 307 N. Michigan, Chicago 1.

SIDELINE: "Gold finished lapel cross". Sample 20c. J. Walter, 39 Bath (5), Ballston Spa., N. Y.

SALESMEN will clean up this year selling our Electric fans and Sump Pumps. Write Universal Fan Co., Peru, Indiana.

ADVERTISING Book Matches—World's largest direct selling manufacturer of Advertising book matches offers opportunity for profitable year 'round selling; Every business a prospect; No experience needed to start; Men or women; Full—part time. Factory service. Low prices for high quality; Repeats; Sales kit furnished. Match Corp. of America, 3433-43 West 48th Place, Dept. N-16, Chicago.

STATE Franchise sell Nearu Perfume to retailers. Bank reference bondable. Stella Inc., 647 Main St., Hartford 3, Connecticut.

47 EDUCATIONAL AND INSTRUCTION

WHY Don't you write? Writing short stories, articles, etc., will enable you to earn extra money. In your spare time we teach you to write the way newspaper men learn—by writing. Free "Writing aptitude Test" tells whether you possess the fundamental qualities essential to successful writing. Veterans! This course approved for Veterans Training. Write today! Newspaper Institute of America, Suite 5668-C, One Park Ave., New York 16, N. Y.

GET a Government job! Start high as $58 week. Men—women. Vets get preference. Prepare now for next examinations. Particulars free. Write, Franklin Institute, Dept. W-23, Rochester 4, N. Y.

EXPERT Bookkeeping, easily learned—15 lesson course $5—Introductory lesson $35—Bernard Buchalter, 1280 (SP) Ocean Ave., Bklyn, 30, N. Y.

HAVE your own office! Many earn up to $5,000-$15,000 Annually. Learn credit-collection agency business by home study course. Experience unnecessary. Write for Free bulletin. No obligation. Franklin Credit School, Dept. 203-C, Roanoke 7, Va.

MAKE up to $30-$40 week as trained Practical Nurse! Learn quickly at home. Booklet free. Chicago School of Nursing, Dept. M-3, Chicago.

WELDING—Electric, gas trade training pays at GI approved Welding school. Catalog free. Write Hobart Welding School, Box F-285, Troy, Ohio.

LEARN Elements of radio at home. Ideal course for beginners. $15.00. Write Waca Radio School, 1421 Sixth Street, S.E., Minneapolis 14, Minn.

ELECTROPLATING! Want a money making trade or profitable business of your own? Learn from nationally recognized authority. It's easy when I show you how! Free details. Joseph B. Kushner, Metal Finishing Consultant, Stroudsburg 1, Pennsylvania.

LEARN Piano Tuning. Prepare for Career in fascinating profession. $5,000 year easily earned. Real security, pleasant easy work. No profession Paying so well can be mastered so quickly. Natural Aptitude, desire to get ahead chief requirements. Prospectus and full information on request. Harmony School of Piano Tuning, Box 582, Harrisburg, Pa.

VALUABLE information on your memory; famous feats of memory; Super-memory; free. Write today. Thor Books, CS-3, Box 1210, Chicago.

BOOKKEEPERS! Increase your earnings! Operate your own simplified "Dollar-A-Week"—Bookkeeping and Tax Service. Full or spare time. Details Free. No obligation. Ellis, Box 18-C, Cedar Grove, N. C.

DENTAL Technicians in Great Demand. Steady money making opportunity. Easy home study in spare time. School of Dental Crafts and Sciences, P. O. Box 1341, Palo Alto, Calif.

CLINICAL Laboratory Technicians in great demand. We train you in your spare time, in your own home. You can practice while studying. Write for free catalogue Imperial Technical Institute, Box 973-B Austin, Texas.

REPRODUCTION without male explained. University Press, Box 921, Baltimore 3, Md.

INTELLIGENCE increased 20% by compound available at pharmacies. Send $1.50 for report. D. Burrows, 30 W. Chicago, Chicago 10.

USED Correspondence courses and educational books, bought, sold, rented. Catalog free. Educational Exchange, Summerville, Georgia.

END Job worries for life. More than 10,000 new Government Civil Service lifetime jobs every month. Men-Women. Write for free booklet: "How to Get A Civil Service Job." Lincoln Institute, Dept. S-1, 7951 Yates Avenue, Chicago 17, Ill.

HYPNOTISM. "How I Hypnotize" 25c. Dr. Lonk, D-1618, Palatine, Illinois.

39 CONTESTS

$1,000,000 FREE—Yearly—Contests. You can win. Need help? Write. Research, 13 Earl St., Red Bank, N. J.

CARS . . CASH . . HOMES . . FREE TO LUCKY CONTEST winners. Win your share with our contest aids. $1.00 brings Prize Contest Bulletins winning answers, entry blanks, Literature free prize Contest Company, Box 12Q, Sta. F, Bklyn 12, N. Y.

77 LANGUAGE OUTFITS

LINGUAPHONE Makes Languages Easy at home. Learn to speak Spanish, Portuguese, Italian, French, German, Russian, by quick, easy Linguaphone conversational method. Save time, work, money. Linguaphone Correspondence Courses are available to veterans under G.I. Bill of Rights. Send for free book. State if G.I. Linguaphone Institute, 54 RCA Bldg., New York 20, N. Y.

10 AUTHORS SERVICE

NEW Writers Needed. Nonfiction material demand is booming. Many magazine editors buy features and "fillers" from new writers. Our Earn As You Learn lessons prepare you to meet their requirements. Experience unnecessary. Reasonable price, unexcelled service. Details, sample lesson free on request. Use postcard. No obligation. Comfort Writer's Service, 210RN S. 7th St., St. Louis 2, Mo.

25 BUSINESS SERVICE

MAIL forwarding service, confidential, 25c letter. Chicago Mailing address of distinction. Prices depending on volume. D&M, 855 North Dearborn Parkway, Chicago 10, Ill.

PURCHASING Agent—$1.00 minimum charge 10% large orders: Clothing, furs, machinery, tools, etc. Satisfaction guaranteed. References. Fenwick's Service, 1216 Park Row Bldg., N. Y. 7.

HOLLYWOOD area. Revealing information. Questions answered $2.00. S.I.S., Dept. C-1, P. O. Box 2295, Hollywood 28, Calif.

HOLLYWOOD postmark. Letters forwarded, 25c each. Arr-Dee, Dept. C, P. O. Box 17, N. Hollywood, Calif.

30 CARTOONING, SIGN PAINTING, DRAWING AIDS

FAMOUS $75 Lockwood Art Course now only $5 postpaid. Other smashing art bargains. Catalog 10c. Art Book Shop, Arnold 6, Mo.

SIGN painting taught at home by an old master. Ben Kerns, Box 812, Greenville, S. C.

SIGNS made easily. Instructions and ten sets modern alphabets, numerals, patterns. Sizes up to eight inches. All for $1.00. Co-operative Business, 7 West Madison, Chicago (2).

9 ALPHABET 3 Numeral Pattern Sets and Catalog $1.00. Sign Letter Distributors, P. O. Box 101, Mineola, N. Y.

LEARN Showcard writing at home in spare time. Fascinating, profitable business of your own. Free information. Sherwood, Box 8, Irvington 11-S, N. J.

"HOW To Make Money With Simple Cartoons"—A book everyone who likes to draw should have. It is Free; no obligation. Simply address Cartoonists' Exchange, Dept. 193-C, Pleasant Hill, Ohio.

TALENT Test Free. American School Commercial Art, Box 8066, Dallas 5, Texas.

31 CHALK TALK STUNTS

CHALK Talks, Laugh Producing Program, $1.00. Illustrated Catalog 10c. Cartoonist Balda, Oshkosh, Wisconsin.

136 TYPEWRITERS

RECONDITIONED Typewriters, Printing Devices, Office Appliances Supplies Dixiegraph, King, N.C.

93A OFFICE SUPPLIES & EQUIPMENT

WHOLESALE Office supplies, typewriters, duplicators. Lists free. Acme, Covington 3, Virginia.

118 RUBBER STAMPS

3 LINES, cushioned indexed 50c Pads 35c. Print-Right, Wauwatosa, Wis.

110 PRINTING OUTFITS, SUPPLIES

PRINTING outfits, type. Send dime for illustrated supply book. Kelsey H-8, Meriden, Connecticut.

"PRINTOMATIC" Selffeeding Post Card Stencil Printing Duplicators $9.50 Up. Office Size Duplicators, Speedoprints, Hilcos, Excellographs $33.41 Up. Literature Free. Pittsburgh Typewriter Supply, 336 WE Fourth Ave., Pittsburgh 22, Pa.

PRINTING Presses, Type, Supplies. Lists 3c. Turnbaugh Service, Loysville, Penna.

INEXPENSIVE home-made printing press. Details free. Novelty Shop, Downsville, Louisiana.

MAKE your own printing cuts. Newly invented plexiplate process. Plexiservice, Argyle 2, Wisconsin.

RUBBER Stamps all kinds, catalogue 10c. Print and Stamp Co., Box 172, Boston 1, Mass.

109 PRINTING, MULTIGRAPHING, ETC.

1,000 BUSINESS cards printed prepaid $2.50. Reliable Print Shop, 901 E. Jefferson, Louisville, Ky.

24 HOUR printing service. Free samples. Mango, 555-B South 20th, Newark 3, N. J.

SEND 10c Now, for our 48 page price-list—Refunded first order. McCall Press (PSM), 1326 South 27th, Omaha 5, Nebr.

QUALITY Printing: Business, personal stationery. State requirements. Samples. Mero Products, 99 Morrison, Punxsutawney, Penna.

SIXTY letterheads, forty envelopes, beautifully printed, $1.00. Calder's, Box 34-22-PS, Phila. 22, Penna.

PHOTO-Offset printing: Form letters, books, circulars, order blanks. Reasonable rates. Samples. Aero-Traders, Adams, Mass.

BETTER Mimeographing! Our electric typewriters cut perfect stencils. Free samples. Multico, 9-11 Cornhill, Boston.

98 PATENT ATTORNEYS

PATENT Protection—The U. S. Patent Office recommends—"An applicant is advised, unless familiar with such matters, to employ a competent registered Patent Attorney or registered Patent Agent, as the values of patents depends largely upon the skilful preparation of the specification and claims." Preliminary steps to take to obtain patent protection will be sent upon request. Victor J. Evans & Co., 342-C Merlin Building, Washington 6, D. C.

INVENTORS—Patent laws encourage the development of inventions. The Rules of Practice of the U.S. Patent Office advises—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skilful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-X Victor Building, Washington 1, D. C.

INVENTORS: Write for free brochure "Evidence of Invention." Labiner, World Building, New York 7.

INVENTOR'S Guide free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7, N. Y.

INVENTORS. For "Record of Invention" form, contact Carl Miller, Registered Patent Attorney, Woolworth Building, New York.

PATENT practice before U. S. Patent Office. Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommel, Registered Patent Attorneys. Suite 413, 815—15th St. N.W., Washington 5, D. C.

C. A. Snow & Co.—S-427, Snow Building, Washington 1, D. C. Registered Patent Attorneys. Write for information.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent. John N. Randolph, Registered Patent Attorney, 207 Columbian Bldg., Washington 1, D. C.

INVENTORS—Send today for "Detailed Patent Information" outlining preliminary steps to be taken toward Patent Protection, also convenient "Evidence of Invention" form. Victor J. Evans & Co., 342-C Merlin Building, Washington 6, D. C.

INVENTORS: Learn how to protect your invention. The patent laws afford inventors protection for the patentable features of their inventions. The United States Patent Office advises the inventor, unless familiar with such matters, to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters. "Patent Guide" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 828-C, District National Bldg., Washington, D. C.

INVENTORS: When you are satisfied that you have invented something of value write me, without obligation, for information as to what steps you should take to secure Patents or Trademarks. Write Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 938 Columbian Bldg., Washington (1), D. C.

PATENTS—Trade marks. Irving L. McCathran, 316 McLachlen Bldg., Washington 1, D. C. Registered Patent Attorney.

58 FOR INVENTORS

PROTECT Ideas yourself—Information free. Birsh, 712 Manhattan Ave., Brooklyn.

INVENTORS—Patent Laws encourage the development of inventions. The Rules of Practice of the U.S. Patent Office advises—unless an inventor is familiar with such matters—that he employ a competent registered attorney or registered agent, as the value of patents depends largely upon the skilful preparation of the specifications and claims. Write for further particulars as to patent protection and procedure and "Invention Record" form at once. No obligation. McMorrow, Berman & Davidson, Registered Patent Attorneys, 143-W Victor Building, Washington 1, D. C.

"INVENTOR'S Guide" free on request. Frank Ledermann, Registered Patent Attorney, 154 Nassau St., New York 7, N. Y.

SAVE your ideas! Drawings of your inventions can be an important step toward future wealth. Our Drawing and Designing Service is absolutely confidential and low in cost! Free estimates. Write today! Machine Design Service, 410 Madison Avenue, Rahway, New Jersey.

INVENTORS: Learn how to protect your invention. The patent laws afford inventors protection for the patentable features of their inventions. The United States Patent Office advises the inventor, unless familiar with such matters, to engage a competent registered patent attorney or agent to represent him. We maintain a staff of registered patent attorneys ready to serve you in the handling of your patent matters. "Patent Guide" containing detailed information concerning patent protection and procedure with "Record of Invention" form will be forwarded upon request—without obligation. Clarence A. O'Brien & Harvey Jacobson, Registered Patent Attorneys, 82A-A District National Building, Washington, D. C.

HIGHEST Royalties—cash. Free literature. Universal Marketing Co., 126 Lexington Ave., New York 16, N. Y.

FREE Service. U.S. Industrial Research Committee, 23 Nelson Ave., Staten Island 6, N. Y.

INVENTORS: Without obligation, write for information explaining the steps you should take to secure a Patent on your invention. John N. Randolph, Registered Patent Attorney, 206 Columbian Bldg., Washington 1, D. C.

INVENTORS: The usual First Step is to have a search of the U.S. Patents conducted, so I can report on Patentability. Write, without obligation, Patrick D. Beavers (Formerly Randolph & Beavers) Registered Patent Atty., 939 Columbian Bldg., Washington (1), D. C.

PATENT searches—reliable, efficient, air mail service—$6.00. Write for free invention protection form. Patent Research Service, 703 Albee Bldg., Washington 5, D. C.

INVENTIONS Wanted—For development. Elo Development Company, 29-28 41st Avenue, L. I. City, N. Y. IR 6-6219.

INVENTION Record, Patent application and search forms plus invention sales data free. Charles Morton, 11 West 42nd Street, New York.

INVENTORS: Reliable patent searches $6.00. Reports back in five days. All sketches returned. "Record of Invention" and "Certificate of Search" forms free. Write Raymond L. Smith, Patent Searcher, 410-S Bond Building, Washington 5, D. C. (Formerly with U. S. Patent Office.)

75 INVENTIONS WANTED

INVENTORS: Hundreds of manufacturers have requested our assistance in locating marketable new products. Complete information, free. Institute of American Inventors, Dept. 30C, 1026 Eye St., N.W., Washington 6, D. C.

INVENTIONS Promoted. Patented or unpatented. Write Adam Fisher Company, 183-A Enright, St. Louis, Mo.

INVENTORS! Have you good, patentable ideas? Write Patent Agent Metzleer, 11 W. 42nd, New York.

SMALL Inventions wanted by manufacturers. I'll help you sell your invention. Write for circular. S. Hull, 7829 Euclid, Cleveland, Ohio.

WHAT Have you for manufacturers? Submit details or request free booklet. Address: Direct Contacts, 11106-B2 Longwood, Chicago 43.

82 MANUFACTURING

LIGHT manufacturing, castings, small stampings, vast experience. Deistler, Cartierville, Montreal, Canada.

SMALL lot production. Aluminum castings; Stampings; Screw Machine. J and M Company, Burlington 2, Kentucky.

MODELS small lot manufacturing, metals, plastics, etc., Millburn, Burlington, Ky.

87 MODELS, MODEL SUPPLIES

MOST complete Illustrated Catalog—"O-HO OO" Model Railroad Parts ever published. Send 5c for mailing. Selly, 1377 Gates Ave., Dept. 836, Brooklyn, N. Y.

MODEL Ship Builders! Are you looking for authentic, precision ship models? Send for richly illustrated fully descriptive catalogue in full color of famous ships of all kinds. Only 25c. Halesite Yacht Service Inc., Dept. C-39, Halesite, Long Island, N. Y.

SHIP and Yacht model fittings; blueprints. Send 25c for illustrated catalog No. 20—Listing hundreds of items. A. J. Fisher, 1002-2 Etowah Ave., Royal Oak, Mich.

BUILD Model Ships, Railroads, Catalog 10c. Ideal, 21 West 18th Street, New York 11, N. Y.

SHIP model kits and fittings, most complete stock in New England, of Boucher. Fisher, Marine Model, Model Shipways. Fittings, plans, tools, model yacht equipment. Illustrated catalog 25c coin. James Bliss & Co., Inc., Dept. M 220 State Street, Boston, Mass.

SHIP Model and yacht supplies, complete large 64 page catalogue, 30c. Wm. Wild, 510 E. 11th St., New York City.

SOUTHERN Woods: Texas Ebony, Mesquite, Brazil, Catsclaw, Guayacan, Huisache, Many others. Working supply, $1.00 each prepaid; sample, dime each; details, stamp. StarCraft 2, Edinburg, Texas.

POWER Models—steam and gasoline engines, steam traction engine, metals, tools. Catalog 35c. Charles Cole, Ventura, Calif.

SHIPMODEL kits and fittings of authentic design and detail. Model kits include brigs, fisherman, cutter, clipper. New catalog, 15c. Model Shipways, Folio 40, 476 Main St., Fort Lee, N. J.

BRASS Gears and model supplies for the inventors. Send 10c for catalog. Pierce Model Works, Tinley Park, Ill.

RAILWAY models, complete line. Combined HO and O gauge, catalogue, 50c. Walthers, 269 Erie, Milwaukee 2, Wisc.

"SUNBEAM" 26" motor boat hull kit for B or C gas motors. Mahogany plywood planking, all parts die-cut. Weigh 12 ounces. $8.00. Also Flywheel, coupling, shaft, propeller, rudder equipment. Circular Morristown Boat Works, Bank Street, Morristown, New Jersey.

HOBBYIST'S Catalogs! Controlog-engine powered, line control model planes, 100 kit photos, construction, flying instructions—10c. Send large self-addressed stamped envelope for free folder featuring famous English Twin Trix 3-rail trains, 164 page Ship Model Kit-Fittings Catalog—35c. Booklog—hundreds of model, hobby, craft books—10c. Send coin, stamps. Polk's Hobbies, "World's leading hobby house", 314(PS) Fifth Avenue, N. Y. 1.

LIONEL Train sets and accessories available. Order today. Roundhouse, Box 273, Newark 2, New Jersey.

STEAM engines—boilers—castings. Catalog 25c. Anton Bohaboy, 2297 Price, Rahway, New Jersey.

BRASS rods, random lengths. Diameters ½" to 3/32". Fourteen ounces for $1.00. J. P. T. Co., P. O. Box 94, Bristol, Conn.

TT GAUGE model railroads. Operating layout on a tabletop. Send for free illustrated folders. John Boyle Sons, 102 S. Wyoming St., Hazelton, Pa.

87 A MOLDS AND MOLDING MATERIALS

RED Seal Rubber Company develops new compound! Genuine natural latex base! Fully guaranteed! Introductory offer for $3.00. Complete mold making course plus quart of Red Seal Latex! Free literature upon request. 116 Nassau St., New York 7, N. Y.

71 HOME CRAFTSMEN

TEXAS ebony. America's most beautiful lathe turning wood. Large piece, $1.00 Prepaid. Sample, dime. Information on Southern Woods. Stamp. Starcraft 2, Edinburg, Texas.

LEATHER-Crafters: Free 1948 catalog showing easily completed projects, full line of tools, hides and accessories. Ester Leather Co., 145 St. Paul St., Rochester 4, N. Y.

LEATHERCRAFT. Pleasant, profitable. Easily learned. Send card for free booklet. Artcraft Leather of California. Dept. PS-3, 271 Twelfth Street, Oakland 7, California.

DO your own professional felt flock finishing. Complete kit includes flock, undercoat, thinner, spray gun and instructions. $9.25 post paid. Write for free color card and circular. Berott-Ross, Dept. 3 B, 411 N. Foothill Road, Beverly Hills, Calif.

FREE folder—"Amazing new service." Materials furnished to build projects featured in this magazine. Project Headquarters, 1756B Henderson, Chicago 13, Ill.

FLOCKING kit 6 packages different colored flock, adhesive, brush, designs, instructions, $1.00 postpaid. A & M Crafts, 316 East 91 Street, Brooklyn 12, N. Y.

SPECIAL Offer: 80 full size toy, novelty and lawn ornament patterns only $1.00. Lynds, Medway, Mass.

GOLD imprinter $3.25. Samples 10c. La Garza, 8 Walden, Cambridge 40, Mass.

SHELL Jewelry Supplies — Wholesale only. McFarland Plastic Co., Sarasota, Fla.

LEATHERCRAFT designs — Handbags $1.00. Billfolds $1.00. Belts $1.00. All three $2.50. Lampkin Artcrafts, Box 641-S, Culver City, Calif.

VALUABLE publication "How and Where to Sell Your Molded Plastic and Plaster Casts Profitably," only $1.00. Postal brings free details. Banks, 6635-16 N. Ave., Kenosha, Wisc.

LEATHERCRAFT! Complete stocks of leathers, tools, supplies. Immediate shipment. FREE catalog. KIT KRAFT, Dept. PS2, 3203 W. Washington Blvd., Los Angeles 18, California.

HUNDREDS Full size patterns:—Easily made plywood novelty furniture for jig and band-sawing, lawn ornaments, plaques, frames, silhouettes, letters, numerals, weathervanes, toys. 150 Crafts-Hobby books and booklets, hundreds decal transfers. Catalog and folders illustrates 465 articles, 25c. (No stamps please) refunded first order. Wo-Met Shop, Box 167, Ashburn, Georgia.

SPECIAL 77 Full Sized Patterns, Lawn Ornaments, Toys and Novelties, $1.00. Modern Woodcraft, Saginaw, Mich.

COPPER Strips, cold rolled, .025 ins. thick. Assortment 5 sizes, 1, 2, 3, and 6 inch widths, 12 inch lengths, $1.90, 24 inch lengths, $3.75 Postpaid. Groundmaster Company, Boulder, Colorado.

AMAZING-New crafts—also weaving-kites leathercraft-metalcraft-intarsia-free catalogue. Del Monte, 725 West 172, N. Y. 32.

LEATHERCRAFTERS! Belt kits, projects, leather, supplies. Free catalog. Arts Leather, 411 Joseph Ave., Rochester 5, N. Y.

PATTERNS—40 pictures of New jigsaw projects. Illustrated folder 10c. Joaness, P. O. Box 141, Omaha 7, Nebr.

MAKE Shell Jewelry profit pleasure. Shellcraft book free. 450 Caribbean shells including findings for making six dollars with $1.00. Shell Company, N.W. First Street, Miami 36, Florida.

FAST selling. Good profits making lawn chairs, furniture, toys. Illustrated folders of popular items 25c, refundable. Summercraft Studio, 42 Vernon St., Dept. KH, Newton 58, Mass.

LAWN chairs, toys, novelties, garden figures, furniture, etc. 62 popular plans for $1.00. Mastercraft, 38, 7041 Olcott, Chicago 31, Illinois.

23 BUILD IT YOURSELF

ENJOY soft water. Simple, easy, plans, instructions $1.00. Huff Industries, 10230 San Carlos, South Gate, Calif.

BARBECUE Oven—Build it yourself in your own back yard with parts and instructions furnished. Write for free information. Bar-B-Kit, 4723 Troost, Kansas City, Mo.

PLYWOOD cabinet kitchen plans-photo-prints-booklet .50c. Playne Cabinets, 4617 Johnson Avenue, Western Springs, Illinois.

ROTARY type, power lawn mowers. Complete machines or parts. Modern Mower, Lohrville, Iowa.

MAKE Plastic wallets. Everything furnished. Details free. Lakeshore Supply, 534 Surf St., Chicago 14, Ill.

MAKE Date attachment to alarm clock, changes itself daily. Simple device. Plans and directions 25c. Sherman, 179 N. Wells St., Chicago, Ill.

BUILT-In Kitchen cabinets—$1.00 brings detailed plans and specifications showing construction methods. Will fit any kitchen. Thombert Co., Box 447, Newton, Iowa.

CAR bed. Build it yourself, inexpensive, fits any 2 or 4 door sedan, detailed plans $2.00. Easy to follow. Martin's, Box 297, Upper Darby, Pa.

BUILD concrete block machines, portable sawmills. Shop, farm, home machines. 70 plans. Catalog-Handbook Free. Nichols Equipment Co., Dept. 904, Purvis, Miss.

"CONCRETE Block Homes" 32 page booklet; drawings, instructions on how to build, $1.00. H. C. Lightfoot, Civil Engineer, Richboro, Penna.

PLAYHOUSES and doghouses scientifically designed. Plans and material list for 4 sizes of either, $1.00 postpaid. C. Miller & Wutkee, 253 Conant Hotel, Omaha, Nebraska.

MAKE "Stroboscope" to freeze motion. Complete kit, plans, experiments, $3.00 postpaid. Storytell Studio, Box 72, Old Chelsea Station, New York 11, N. Y.

SPECIAL. Full size patterns make over 100 toys, $1.00. Complete plans for over 20 modern kitchen cabinets, $1.00. Free list. Masterprint, White Building, Buffalo 2, N. Y.

KITCHEN Cabinet book. Complete plans, instructions eleven popular styles. How to plan modernized kitchen, build, install new cabinets at big saving, $1.50. Craftsman, 115-S Worth Street, New York 13.

MAKE Marine engines kits for Ford. Six low cost. Trident Company, Box 4051, Dundalk, Maryland.

139 WATCH REPAIRING

WATCH and clock repairing increasing, complete home study course with drawings and pictures. Information free. Houston Chronometer and Watch Co., P.O. Box 1140B Houston 12, Texas.

WATCH and clockmakers Handbook—Britten $5.79. Free catalog. Engineers' Book Service, 19 W. 44th St., New York City 18.

WATCHMAKERS' Journal contains valuable informations on watch repairing. Sample copy 15c. Dean Co., 116 Nassau St., New York 7, N. Y.

95 OLD GOLD, WATCHES, ETC.

WATCHES, Wholesale, Rebuilt-like-new Elgins, Walthams, Bulovas, Etc., $9.75 up. Catalogue free. Brookings, B-1975W, Little Rock, Ark.

GOLD $35.00 Ounce—Mail old gold teeth, diamonds, jewelry, watches—receive cash by return mail. Satisfaction guaranteed. Free information. Dr. Weisberg's Gold Refining Company, 1500-B Hennepin, Minneapolis, Minn.

CASH for Old, Broken Jewelry. Highest prices paid immediately. Mail gold teeth, watches, rings, silverware, diamonds, spectacles. Satisfaction guaranteed. Information free. Rose Smelting Co., 29-Y East Madison, Chicago.

76 JEWELRY

JEWELRY Findings. Lowest Prices. George Sassen, 154 Nassau Street, New York 7.

CERAMIC Jewelry Supplies. Bar Pins, ear screws, for ceramic and woodworkers, also, glass and sea shell assemblers. Free catalog. Philadelphia Badge Co., 1007 Filbert St., Philadelphia, Pa. Dept. E-1.

RHINESTONES — Moonstones — Pearls —Findings. Free literature. Herber, 1360-B Hicks, New York 67.

IMITATION miniatures for jewelry and novelty makers. Look like genuine. Sample with setting, 15c. Also chain, filigree stampings, etc. Trinity, 2498—65th St., Brooklyn 4, N. Y.

SILVER looks better. Inexpensive too! Sterling chain, wire or sheet for jewelry, name plates, initials, etc. Prices quoted on any amount. Dept. C, Empire Smelting Co., 718 Sansom St., Phila. 6, Pa.

MANUFACTURE costume jewelry at home for profit, hobby, therapy. Free wholesale supply catalogue. Instructions. Florida Supply House, Bradenton, Florida.

GEMSTONES available rough or cut. Precious, semi-precious. Custom cutting and polishing. Plummer's, 5068 Brighton, San Diego 7, Calif.

PRECIOUS, semiprecious stones, plastic-metal findings, list 10c refundable with first order. Pickwick Findings, Box 780-K, Stamford, Conn.

MAKE shell costume jewelry at home. Complete supplies Kits. Catalog. See Display. Tropical Shell-Art, 2 North Third Avenue, Mt. Vernon, N. Y.

JEWELRY, Shell pansy ear screws $6.00 doz. Box 486, Davis Dam, Nevada.

HOBBYISTS — Jewelry craftsmen. Polished obsidian stones, various shapes, 25c each. Findings, supplies, etc. Advisory Service. Gaston's, 424 So. Broadway, Room 907, Los Angeles, Calif.

132 TOBACCO & PIPES

PIPE Carving kits 75c. Seconds $5.00 pipes 65c. Literature free. Carvapipe, 2829A Dixie, Hamilton, Ohio.

113 RAZOR BLADES, SHAVERS

EXCEPTIONALLY fine razor blades. Sample free. "Service", 1332 R Findlay, New York 56.

86 MISCELLANEOUS

HULL Automobile compass, value $4.95, brand new $2.50. Prisms for 6 x 30 or 8 x 30 binoculars, brand new, $1.50 each. Offset prisms to be attached to 7 x 50 binocular. Cost $98.00, special $25.00. Green sunshades for binoculars, size 6 x 30 and 7 x 50, snap on type, value $7.50, special $1.25 per pair. Forward money order. No C.O.D. shipments. Send coin $1.25 for Third Annual Edition of Gun Digest together with our complete catalog of new and used guns, ammunition, rifles, binoculars and powder flasks. Our Public Sport Shops, 11 S. 16th Street, Philadelphia, Pa.

MEN! Large size shoes, large size sox! We specialize in large sizes 10 to 16, widths AA-EEE. Oxfords, Hitops, work shoes. Guaranteed extra quality. Free catalog. Kingsize, 468 Brockton, Mass.

RECORDINGS—Bikini Atomic test, $4.79. Sound Snap, 479 Parkwood, Columbus 3, Ohio.

AMERICA'S most complete line of quality handicraft kits, leathercraft, jewelry, shellcraft, wood inlay, plastics carving, cedar chest, metal tapping, and many others. Send dime for most interesting catalog you ever read. Beaver Crafts Inc. Dept. L-3, 11578 S. Wentworth, Chicago 2?

GOLFERS: I will inform you about fault in Swing that causes you to Slice, pull, or shank. Send $1.00 and Stamped addressed Envelope to Alex Miller, Former Pro, East Bradenton, Florida, Route 2, Peaches Court.

TIE Trade. Send us six old ties and one dollar. We'll send you six different all beautifully cleaned. Tie Trade, Station A, Box 392, Ames, Iowa.

THREAD restorers, renew damaged threads, literature. Bowers Hardware, Sta. A 175P, Canton, Ohio.

PLANS or schematics for any type of radio, amplifier, phonograph, etc. $1.00. R. G. Harris, 1336 W. Chase Ave., Chicago 26, Ill.

BOOKFINDERS! (Scarce, out-of-print unusual books) Quickly supplied. Send wants. Clifton Company, Box 1377 PSM, Beverly Hills, Calif.

INQUIRE Now about our Home Plan Service for 24' x 26' x 30' one floor, two bed room homes. Write today for particulars. Columbia Small Home Plan Service, Dept. 50, 1570 Hawthorne Park, Columbus 3, Ohio.

FIREWORKS: Don't be disappointed. Get Famous Banner Fireworks with all the newest and startling effects. Giant Cannon Salutes that rock you like a crash of thunder. Whistling Devils with weird unearthly noises. Skyrockets that burst in majestic colorful display. Gasp in amazement as you watch the "Battle In The Clouds". Genuine Chinese Firecrackers. Over 200 pieces including Sparklers for the little tots. Retail value over $11.25 for Only $4.95. Rush order today. Any quantity. Send money order, bank draft or currency, no C.O.D.'s. Banner Fireworks Mfg. Co. Inc., Dept. 111, 446 Capistrano, Toledo 12, Ohio.

ATTENTION: Mechanics, craftsmen, weld small steel and cast iron parts instantly using ordinary gasoline blo wtorch. Instructions $1.00. Cameron's Sewing Machine Shop, Camrose, Alberta, Canada.

WAR Surplus—Oil transmissions, input up to 2 h.p. @ 4000 r.p.m. Output infinitely variable either direction. Suitable for motor scooters, mechanisms, etc. $25.00 fob. Keego Harbor, C. J. Cartwright, Box 583, Keego Harbor, Michigan.

RECEIVE Giant mails, samples galore! Two year listing, $1.00. Nine months, 50c; Three months, 25c. Stanford, 6220-N 16th, Philadelphia, Pa.

GET Lots Of Mail: Name Listed Three Directories 25c. Harvey Teeple, Decatur, Ind.

MAKE Perfume, profitable, sparetime, home, business, Men, women write "International," 6347 Parnell-S20, Chicago 21, Ill.

BURGLAR Alarms any system foolproof, easy to install. For home, store or factory $18.50 to $85.00. Electric-eye, (invisible) up to 1,000 Ft., $18.50 to $300.00. Gas station alarms, $7.50 up. J. & Jean Signal Co., 220 Graham Ave., Paterson, New Jersey.

KEEP informed on technical ideas overseas. Practical Mechanics, Britain's No. 1 technical monthly, only journal of its kind, brings experts information on atomic energy, rocket propulsion, television, aeronautics science, engineering, electronics, models, photography, home workshop, etc. Lavishly illustrated. Many plans, diagrams. Yearly (12 issues) only $2.00. From Practical Mechanix, U. S. Subscription office (Dept. P.S. 5) 126, Lexington Avenue, New York City, N. Y.

U. S. Surplus clothing, men's, women's. Amazing bargains. Free catalog. N. Y. Clothing Co., 2079B, Second Ave., N. Y. 29.

CREW manager, wagon jobbers, agents. Establish [illegible] with top quality floor waxes and polishes—all sizes from pint to drum. Write Windsor Wax Co., Inc., Dept. PS-1, Hoboken, N. J.

UNUSUAL, Amusing novelties, samples 10c. Modern, P. O. Box 2, New York 2.

TEPEE Novelty Shop, Ipsunich, So. Dak., Box 236A, has beautiful Indian tepee lamp shades in bright colors, designs. Sparkling glass finish. Details free.

ELECTRIC Heater — Wonderful value regular $12.95, only $6.95 delivered. Underwriters approved. 1225 watts. 115 Volts. Vogt Mfg. Co., Box 1122, Louisville, Kentucky.

GOLD—$70 an ounce possible soon. Free booklet on panning gold, instruction book-supplies. Old Prospector, B-93, Dutch Flat, Calif.

PIN-UP photos—professional models. 24 actual glossy photographs $1.00. Special Offer Six different sets (144 photos) $5.00 postpaid. Irving Klaw, Dept. SA, 212 East 14 St., New York City 3.

HYPNOTIZE! Control the minds and actions of others! Completely illustrated course $1.00. Money Back guarantee. Fowler, Box 1284, Boston 4, Mass.

PIN-Up-Girls! The real McCoy! 5—$1.00. Hollycraft Specialties, Box 17—Station D-PS, Los Angeles, Calif.

GORGEOUS Pin-up girls. Actual photographs. 13 for $1.00. Cosmo Photos, 329 6th Ave., N. Y. C.

FREE literature how to locate buried treasure and minerals. Fisher Laboratory, Inc., Palo Alto, Calif.

ART Photos! Sample 50c. 3 for $1.00. Post Office Box 2011, Phoenix, Arizona.

SAVE-Time design with Modular Scales. Free folder: Palmer, 3207 Eleventh, South Arlington, Va.

SWISS musical boxes repaired. Send unit and $2.00 plus return postage. Innovation, Box 141, Station P, Brooklyn 12, N. Y.

ANGLE surface and sine Plates, free literature. Mathis Machine Corp., South Bend, Indiana.

GET $1.25 guaranteed Fire extinguishers. Scheall, Box 225-S, Duluth, Minnesota.

PENCILS imprinted with your name. 18 for $1.00. Andrews, 275 Bittersweet, Berea, Ohio.

APPLIANCE & building repairs. Own your own business. Free particulars. C. A. Griffith, 132 Water St., Fredonia, N. Y.

BECOME a real estate broker. Write for Free details. Stambough, 901 Cedar, Plainview, Texas.

WEATHER Instruments, Thermometers, barometers, hygrometers, rain gages, wind instruments. Science Associates, 401 N. Broad St., Phila. 8, Pa.

WEATHER. Be your local weatherman. Take observations, make forecasts. Join the Amateur Weatherman of America, Franklin Institute, Phila. 3, Pa.

LOVELY Pin-Up Girls. Real, Actual Photographs. 10 for $1.00. Sixty different $5.00. M. Wilkins, 417 Hill, London, Canada.

PHOTOGRAPHS Of action. I have a private collection of actual photos of Gorgeous Hollywood beauties in action. Specially prepared to thrill you. I'll send these in plain wrapper for $1.00 while they last. Comera, Box 2388A, Hollywood 28, Calif.

HOME. Made cream caramels $2.00 a lb. Send 25c for a sample box. Mrs. Macqueen, 1015 Loyola Ave., Chicago 26, Ill.

89 A FOR SALE—MISCELLANEOUS

RESISTAL Concentrated all-purpose cleaner. For homes, institutions and industry. Success Sales, P. O. Box 5157, Indianapolis, Ind.

138 WANTED MISCELLANEOUS

MERCURY—Highest prices. Free Containers. Write Mercury Terminal, Norwood, Mass.

101 PERSONAL

RUPTURED? Marvelous relief with new Air-Flo truss. No personal fitting necessary. Send for circular. Watkins Co., Dept. SP3, 100 West 42 St., New York City.

GETTING Bald? Losing hair? Have dandruff? New scientific method using sulfanilamide is helping men in all stages of baldness. Write today for free, confidential guidance on how to restore scalp health. Eugene Burt, 1928 State Blvd., Kansas City, Kansas.

HOW You Can Find Out! Information discreetly developed. Any matter, person, problem, anywhere. Personal-Business assignments, representations undertaken. Nationwide. Officially licensed, bonded service. Established 1922. Reasonable. Confidential. William Herman, 170 Broadway, New York.

BORROW by mail. Loans $50.00 to $300.00 to employed men and women. Easy, quick. Completely private, confidential. No endorsers. Repay in convenient, monthly payments. Details free in plain envelope. Write State Finance Co., 320 Securities Bldg., Dept. C-14, Des Moines 9, Iowa.

RUPTURED? Positive comfort, no underatraps, no steel, no elastic. Write Smith Manufacturing Co., Preston, Ontario.

FALLING hair, dandruff, dry or oily scalp? Write Opal M. Smith, Hair and Scalp Specialist, 705 Chestnut, St. Louis 1, Missouri.

MAIL forwarded from Los Angeles, California, 25c per letter. Mail Exclusives, Box 7765, Los Angeles 15, California.

"LENT—Easter customs." 25c. Bulletin, Box 87, Cathedral Station, New York 25.

MATRIMONIAL—Sweetheart Magazine, 50c. 6 mos. $1.00, Yr. $2.00. Barwood, 2037-E 42nd, Astoria, N. Y.

HAIR Falling? Dandruff? Write Trichologist, 139 Lewis Street, Phillipsburg, N. J.

MORE and better hair for you. All about latest secrets, discoveries. Write immediately. Bruns, 3307-E Fremont, Madison 4, Wisc.

WRITE a letter for publication in my "friendly" magazine. Subscription $1.00. Let me help you personally with all your problems. Jack Wilcox, Problem Editor, G.P.O., Box 112-P, New York 1, N. Y.

PILES? Worry not. Sure relief. Free particulars. J. Ragno, 1409 Orange St., Berwick, Pa.

ART, scenic photo 35c. 4 $1.00. Color slide 50c. 3 $1.00. Novelty Supply, 1227 East Van Buren, Phoenix, Arizona, Dept. D.

LEARN Amazing Hypnotic powers. Secret instructions. 50c. Lerner, Box 28, Bronx 67, N. Y.

TRUTH About Mind Power! 20 Years research. Startling, concise, authentic. Amazing results! Complete $1.00. Saunders, 1345 Holly Ave., Holly Hill, Florida.

BUY Vitamins Direct. Amazing Savings. Money Back Guarantee. Our 9th year! Postcard. Matoska Products, White Bear Lake, Minn.

MAIL forwarding service. 25c per letter. Box 534, Tallahassee, Florida.

SINGLE, unmarried person, desiring information concerning future happiness, request Free confidential literature. Strone, Box 157-00, New York 11.

DO You have a problem? Let's discuss it! An impartial analysis will help you solve it. (No medical or legal) Enclose $1.00 for prompt reply. Mrs. Wallace, Box 6645-AH, San Antonio, Texas.

WORRIED? Let us advise you. Fee $5.00. Personal Counselling Service, 312B W. Wesley, Jackson, Michigan.

TROUBLED with dry dandruff, itching scalp, excessive hairfall. Postcard brings free booklet; details. Simple home regime relieves nine out of ten. Regime Counselors, 9 South Clinton, Dept. S, Chicago 6.

1 ADVICE

LEARN Instantaneous scientific healing by "Cosmic Rays and Cosmic Consciousness." free. Please send name for big pamphlet containing all needed pages of startling book. Crane, Publisher, Kingsport, Tenn.

RUPTURE Cured in 1 month German invention. Write for letterskatch $1.00. Picus, 85 Niagara Str., Providence, R. I.

2 ADVERTISING

ADVERTISING: Place in any publication, anywhere. Write for mail-order rate sheet "S". LeGrand Advertising Agency, (Established 1923), Floral Park, N. Y.

24 WORDS in 64 Weeklies $4.96, J. Darnell, 730 Hays, Jackson, Tenn.

ADVERTISING Sensation! Reach 2,100,000 families. $32.90 inch. Display, classified, ratebook (newspapers, magazines, mailing lists), advertising assistance, free. Chicago Advertising Agency, 20-PS, West Jackson, Chicago 4.

INCH Display Advertisement Mail-order World, year $24. Wood's Popular Services, Atlantic City, New Jersey.

ADVERTISE: 24 words, 40 Newspapers $3.50. Lists free. Advertising Bureau, 229-P Dixon, Uniontown, Pa.

130 TAXIDERMY

FINEST Glass Eyes; Taxidermy Supplies. Catalog Free. Elwood Company, Dept. 235, Omaha 2, Nebraska.

45 DRAFTING INSTRUMENTS

SAVE on drafting materials. Free catalog. Draftsmen's Supply Co., 32 North Wells, Chicago 6.

DRAFTING templates, architectural, mechanical. Free list. Timely, Box 206-N, Columbus 9, Ohio.

DRAFTING Machine—used "Post"—A1 condition with 12" and 18" scales $55.00. L. E. Stear, 505 E. Main St., Midland, Michigan.

129 TATTOOING SUPPLIES

TATTOOING Outfits, Supplies, Illustrated List Free. Zeis, 728 Lesley, Rockford, Ill.

120 SCIENTIFIC SUPPLIES

THE Indian Pope Science of Healing $1.00. The Artisan Psychiatrist, 281 E.M. Watertown, N. Y.

27 A CANDY MAKING

MEN-Women—"Most Everybody Likes Candy." Learn to manufacture Professionally at home. (Our 38th year.) Ragsdale Candies, East Orange, N. J.

64 GARDENING

GLADIOLUS—Huge flowering assortment 50 bulbs, $5.00 prepaid. Satisfaction guaranteed. D. Allen, Hopewell, N. J.

142 WOODS

BUSINESS cards of real wood. Write Cards of Wood, Manlius 2, N. Y.

27 CAMPING

ARMY tents, canvas, clothing, paint. Dept. P, Jarashow, 10-19 Jackson, Long Island City 1, N. Y.

81 A MAGNETS

ALNICO Magnet—Lifts Ten Pounds! $1.00. Catalog 3c. Ronald Eyrich, Box 849, Milwaukee 1.

ALNICO magnets. Free list. Terry Sales Company, 3726 South Detroit Av., Toledo 9, Ohio.

ALNICO Magnets—Easily lifts pound 8.50 Pair. Edwards Industries, 4268 Shenandoah, St. Louis 10, Mo.

TWELVE Alnico Magnets, 100 experiments, $3.00. Experiments, 25c. Disc Magnet, $1.00. Eljay, Box 891, Newark 1, N. J.

134 TREASURE FINDERS

METAL Detectors. The Very Latest Circuit. Free Literature. Hedden Metal Detectors, 538 North Homewood Avenue, Pittsburgh 8, Penna.

TREASURE Hunters! Radically new Goldak locators. New featherweight Model 101 weighs only 11 pounds! Revolutionizes location of Gold, Silver and Minerals. Money-back guaranteed superior any other. Write The Goldak Co., 1544 W. Glenoaks, Glendale 1, Calif.

M-SCOPE Metal Locator fully guaranteed and unsurpassed in efficiency. New featherweight models. Time payment plan. Free literature. Fisher Research Laboratory, Inc., Palo Alto, Calif.

42 DETECTIVES

DETECTIVE Training. Phillips Secret Service, 1917C, N. Kenneth, Chicago 39, Ill.

DETECTIVES—Work home—Travel. Experience unnecessary. Write Wagoner P-125 West 86th, N. Y., N. Y.

DETECTIVE Training. Thirty years experience. Free details. Shewbridge System, 216 Valdez Avenue, San Francisco 12, Calif.

65 HAIR PREPARATIONS

MONEY back guarantee—Lano-Scalp Treatment kit. Dandruff, falling hair. $2.00 Postage prepaid. Stella Inc., 647 Main St., Hartford 3, Connecticut.

93 NAME LISTS

MAILING lists; most classes, 1000 $5.00. Free Prospectus. Dixie Service, King, N. C.

84 MILITARY INSIGNIA

FREE—3 Military Emblems, with Catalog 10c. Hobbyguild, X35 West 32, N. Y.

SAVE Money!

Only **$1.98** Postpaid

BE A PRACTICAL HANDYMAN

Professional "Tricks of Trade"

Carpentry made Easy! New self-instruction course in one handy volume, complete with full page photos, diagrams, etc. Teaches woodworking, painting, upholstering, power tools, etc.

Gives you new ideas and plans for fixing up your basement or attic, shows you how to make linen closets, night table, even a combination bookshelf-bar-radio. Learn to do these pleasant jobs to make your home more comfortable and to save money. Complete price **$1.98.** Mail coupon below. Satisfaction or refund.

Learn How to HYPNOTIZE!

***Develop your personal* POWER!**

NOW...revealed for you...are the secrets of **practical hypnotism**... that strange, compelling force by which an expert operator can bring others under his power. He can **sway** people at will—issue commands and be obeyed—virtually cast a **spell** over his subjects. This sensational knowledge may make YOU a more dominant, masterful personality.

Illustrated* SELF-INSTRUCTION COURSE *in Useful Hypnotism

Amazing lessons in simple, easy-to-understand language. How to select a subject—how to hypnotize by telephone—**how to make money** from hypnotism—mental telepathy—stage hypnotism—self-hypnosis—how to use **modern** hypnotism to conquer inferiority complex, timidity, etc. Clear helpful pictures show operating positions, movements. ***Startling low price.*** Satisfaction guaranteed or money back.

COMPLETE **ONLY $1.95**

Full price only **$1.95** postpaid, nothing more to pay. You will be amazed at what practical hypnotism can do for you! Use the no-risk coupon at the bottom of this page . . . and mail it today.

MENTAL SCIENCE

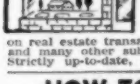
AWAKEN YOUR HIDDEN POWERS!

You are a sleeping giant . . . learn how to release your unused forces. Now this practical reading-course in everyday psychology. Teaches you self-mastery, influencing others, getting ahead, etc. Written by 34 psychologists. Low price. Now only **$6.95** (was $10). Check coupon below for inspection at our risk. You must be 100% satisfied!

SUPER JU JITSU

Now.. get tough DOUBLE-quick!

Step up **YOUR** fighting power, learn lightning-quick American SUPER Ju Jitsu. Develop your body . . . be dangerous! Big illustrated home-study course, reveals secrets on how to make deadly weapons of just your **bare hands.** Easy to learn. Get these amazing lessons right away . . . you owe it to yourself. Complete price only $4.95, nothing more to pay! Mail coupon below with **$4.95** and shipment will be made at once. Satisfaction guaranteed or refund.



REAL ESTATE BUSINESS

The foundation of all wealth is land! Train yourself for a career in this booming profession. Here is the information you need on how to get started and how to get ahead in real estate. Includes instructions on appraisals, valuations, management, investments, practical real estate operating, low cost housing, the law on real estate transactions including legal forms, etc., salesmanship, and many other subjects a successful real estate man must know. Strictly up-to-date, complete, only **$6.95.** Money-back guarantee.

HOW TO SELL LIFE INSURANCE

Virtually a self-training course on the art and science of making money in life insurance. Includes detailed instructions on how to start in this profitable profession: tested and successful methods of getting new prospects; 27 best methods of approach; how to close and get the prospect to buy NOW; how to service old customers for greater profit. Here are dollars-and-cents instructions on how to sell more policies and make larger commissions on those you are already selling. Actual illustrations and examples given throughout—no generalized theory! Latest new edition, complete, only **$6.95.** Satisfaction guaranteed.

SUCCESS!

How to Get Along in this World

Here, gathered together for the first time, are 5000 gems of worldly wisdom on how to live joyously, successfully . . . how to handle people, make money, be happy. Written out of **actual experience** by the best brains of mankind . . . during the past four thousand years! To-the-point, **workable** instructions on getting ahead. Only $1. Included are lessons on **how to use** these quotations in your daily life. Check coupon below and mail with only $1 as full payment.

Short-Cut Mathematics

COMBINED WITH

Practical Mechanics Simplified

Be a "master mind." Learn how to juggle figures, do baffling tricks with numbers. Add long columns of figures this lightning-quick, short-cut way. Multiply 4 figures by 4 figures without old-fashioned multiplication. Here are speedy, simplified systems used by stage "wizards," expert accountants, engineers. Only $1. Course includes illustrations, problems, answers. Mail coupon below!

watch and clock repairing

Learn at Home—In Your Spare Time

Prepare for a happy future of prosperity, security ... and get a big-pay job now. Fascinating, high-grade occupation. You can **EARN WHILE YOU LEARN.** Excellent field for part-time work at home.

Practical Course in HOROLOGY

Thorough self-instruction training in American and Swiss watches, clocks. Special sections on alarm clock repairs. Interesting, LEARN-BY-DOING instruction method. Learn **QUICKLY,** easily. No previous experience necessary. WATCHMAKING IS BASIC TRAINING FOR AIRCRAFT INSTRUMENT WORK and other scientific precision jobs.

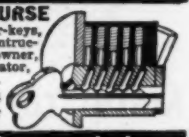
Amazing Low Price!* • *Money-Back Guarantee!

Get into this fast-growing field NOW . . . big opportunity . . . don't delay. Complete price is only **$4.98,** postpaid. This includes everything. Mail coupon below.

locksmithing and key making

PRACTICAL UP-TO-DATE COURSE

How to pick locks, de-code, make master-keys, repair, install service, etc. New, self-intruction lessons for every handyman, home-owner, carpenter, mechanic, service station operator, fix-it shop, hardware dealer, gunsmith.



53 Easy Illustrated Lessons

Low Price! Satisfaction guaranteed or money back. Full price is only $3.95 postpaid.

practical RADIO servicing

SELF-INSTRUCTION COURSE

Teaches you the **practical** side of radio.. repair, adjustment, operation, alteration, trouble-shooting. No previous knowledge necessary. Large clear illustrations, diagrams, charts, etc. **●INTERESTING STEADY WORK!** Set up a radio repair shop of your own—or prepare for booming industrial electronics. This useful, how-to-do-it course brings you all the fundamentals, including mathematics, review questions, problems, answers. Strictly up-to-date. Low price. Only $3.95 postpaid. Mail no-risk coupon below to see this course on money-back guarantee.

NELSON-HALL COMPANY, Dept. C-01
1139 So. Wabash Ave., Chicago 5, Ill.

You are sure to be amazed with these up-to-date, self-instruction courses in handy book form. All practical money-making information. Look them over **without risk.** Check coupon to right. We ship C.O.D. plus postage, or will prepay postage if you send full payment with your order. Mail coupon today, sure.

BE A SUCCESS!

Take this first step *now*

Check, clip and mail coupon to see the courses that interest you. We guarantee you will find them immensely valuable. Since 1909 more than 450,000 home-study students have benefited from Nelson-Hall texts.

SATISFACTION GUARANTEED OR REFUND

MAIL THIS NOW

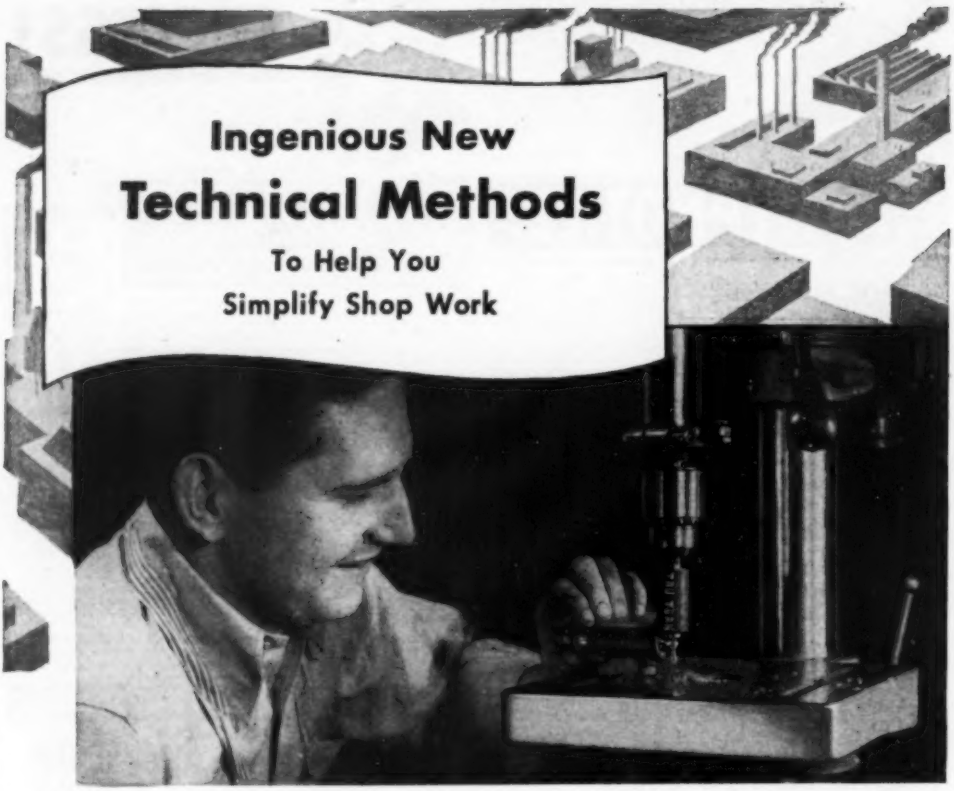
NELSON-HALL CO.
Dept. C-01
1139 S. Wabash Ave.
Chicago 5, Ill.

Please send me the items I have checked below. If I am not more than satisfied I will return them within 10 days and you will make immediate full refund.

( ) Success $1.00
( ) Short-Cut Mathematics .. 1.00
( ) Watch & Clock Repairing. 4.95
( ) Locksmithing & Key Making 3.95
( ) Practical Radio Servicing. 3.95
( ) Build It Yourself..... $1.98
( ) Hypnotism 1.95
( ) Mental Science 6.95
( ) Super Ju Jitsu 4.95
( ) Real Estate 6.95
( ) Life Insurance 6.95

☐ I enclose $..... in full payment. Ship entirely postpaid.
☐ Send C.O.D. for $.....plus postage and C.O.D. fees.

NAME .....
ADDRESS .....
CITY .....STATE .....



Metal Turning Made Easy with New Simplified Tool!

A new tool called "Tru-Turn" makes possible the conversion of drill presses, woodturning lathes, or grinder stands into tools that will turn and cut-off steel, bronze, copper and aluminum. The "Tru-Turn" tool shown above is mounted on a Buffalo Drill Press, Spindle Size.

The "Tru-Turn" tool is easy to operate and cuts and turns bar stock of steel, bronze, copper and aluminum measuring ¼", ⅜" and ½". Its built-in micrometer permits adjustments that give tool-room accuracy to 1/1000 of an inch.

Small tool shops as well as all types of repair shops and garages find the "Tru-Turn" ideal for cutting long pieces of bar stock into desired lengths. Also, home craftsmen are able to produce accurate, highly finished precision-machined parts from metal even without previous training.

Accurate, precision work is also easier to do when tension is relieved by chewing gum. The act of chewing seems to make the work go easier, faster—thus helping on-the-job efficiency. For these reasons Wrigley's Spearmint Chewing Gum is being made available more and more by plant owners everywhere.

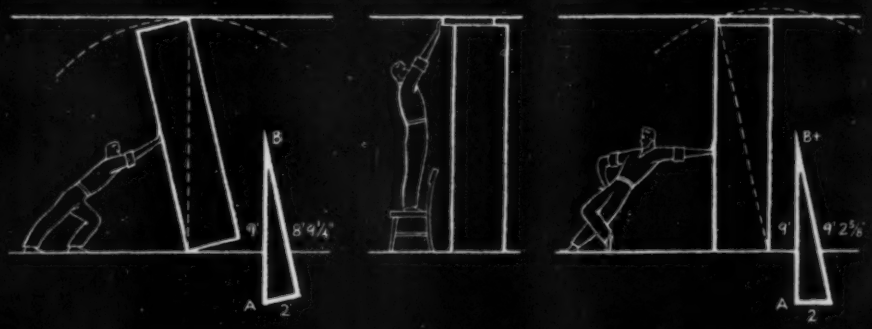
You can get complete information from
Millholland Screw Products Corp., 132 West 13th Street
Indianapolis 2, Ind.

Tru-Turn Tool

AC-59

PS
The Voice of Science

Science is the PRACTICAL approach



YOU hear it every day . . . "the scientific approach." One man says he's "scientific" when he gets enough right answers from Lady Luck. Another waves away science as theory, says *he* is "practical." He's the man with the built-in boat in his cellar.

What is this "scientific approach" anyway? Isn't it just good guessing? Partly—but *orderly* guessing. Call it double-header thinking. Peeling down the problem to get the right questions; then looking for the right answers—according to plan.

Some people have trouble getting answers because they simply don't know what they want to know. Others grope for the answers like a sleepy man in a bathroom feeling for the light switch that's on the other wall.

° ° °

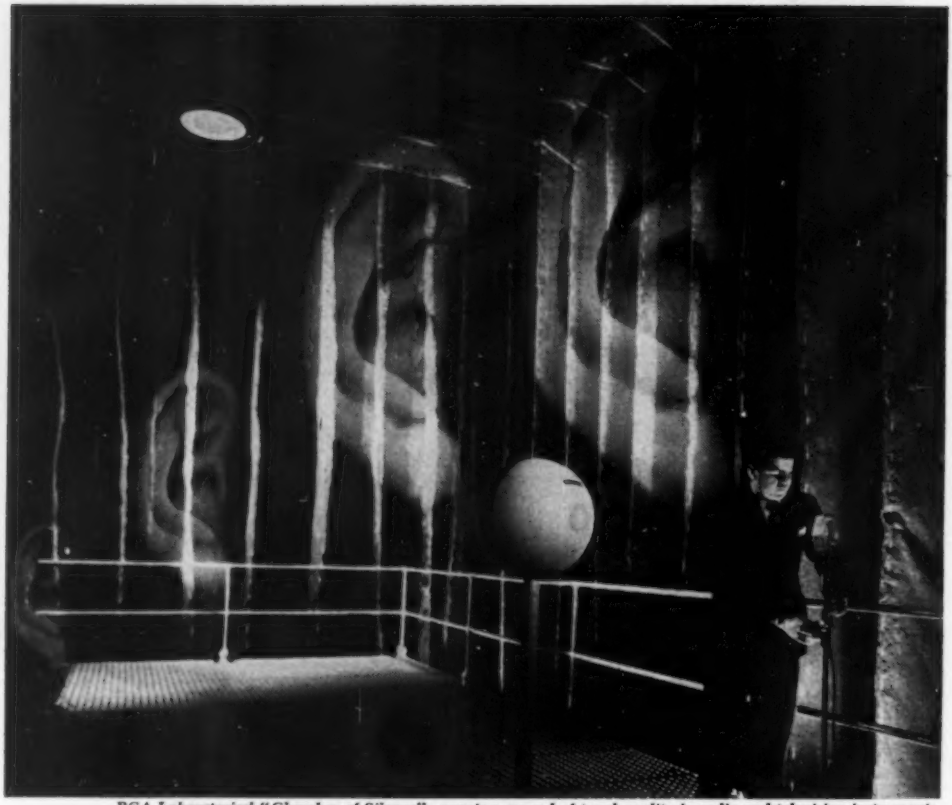
Here's a sample of the scientific approach that might come in handy. You need a short partition in a room, a cabinet would be fine. But how anchor it when the landlord is fussy about nails? Simple. Rock in a cabinet whose longest dimension (its diagonal across the end) will clear the ceiling as you push it into place. Then slide in a board or a box to fill the gap. Pad the top to protect the ceiling; fasten the filler block to the cabinet. Go ahead and lean against it.

If you have a 9-ft. ceiling, the tallest cabinet you can get in under it will be 9 ft. on the diagonal. If the cabinet is 2 ft. deep, your cabinet will be about 8 ft., 9¼ in. high. Your filler block, therefore, will be about 2⅝ in. thick. Now you've got a thing 9 ft. high. It *can't* fall over because its diagonal is now about 2⅝ in. longer than 9 ft.

We know this because about 2,500 years ago a Greek named Pythagoras proved it out. He figured out the square of the long side of a right-angled triangle was equal to the sum of the squares of the other two sides. It is: always.

Sure, the whole thing can be done by rule of thumb, but this scientific approach is actually quicker and easier than cut-and-try. And some things cannot be dry-run. Science makes it possible to build things on paper. To know before it's too late that the boat will pass the angle of the cellar stairs. And that the cabinet snugged against the ceiling will go in—and not come out.

Perry Gilkeson



RCA Laboratories' "Chamber of Silence"—proving ground of tonal quality in radio and television instruments.

Ever hear SILENCE?

You walk into an eerie room. The door swings shut and you're wrapped in a silence so complete that it's an effort to listen. Sound in this vault-like cavern is reduced to the minimum of hearing.

But even *silence* has a sound of its own. Faintly you hear a subdued hiss; sometimes a soft hum. Scientists have suggested this may be the "noise" of molecules hitting the eardrums. Others wonder if it is caused by the coursing of the body's bloodstream.

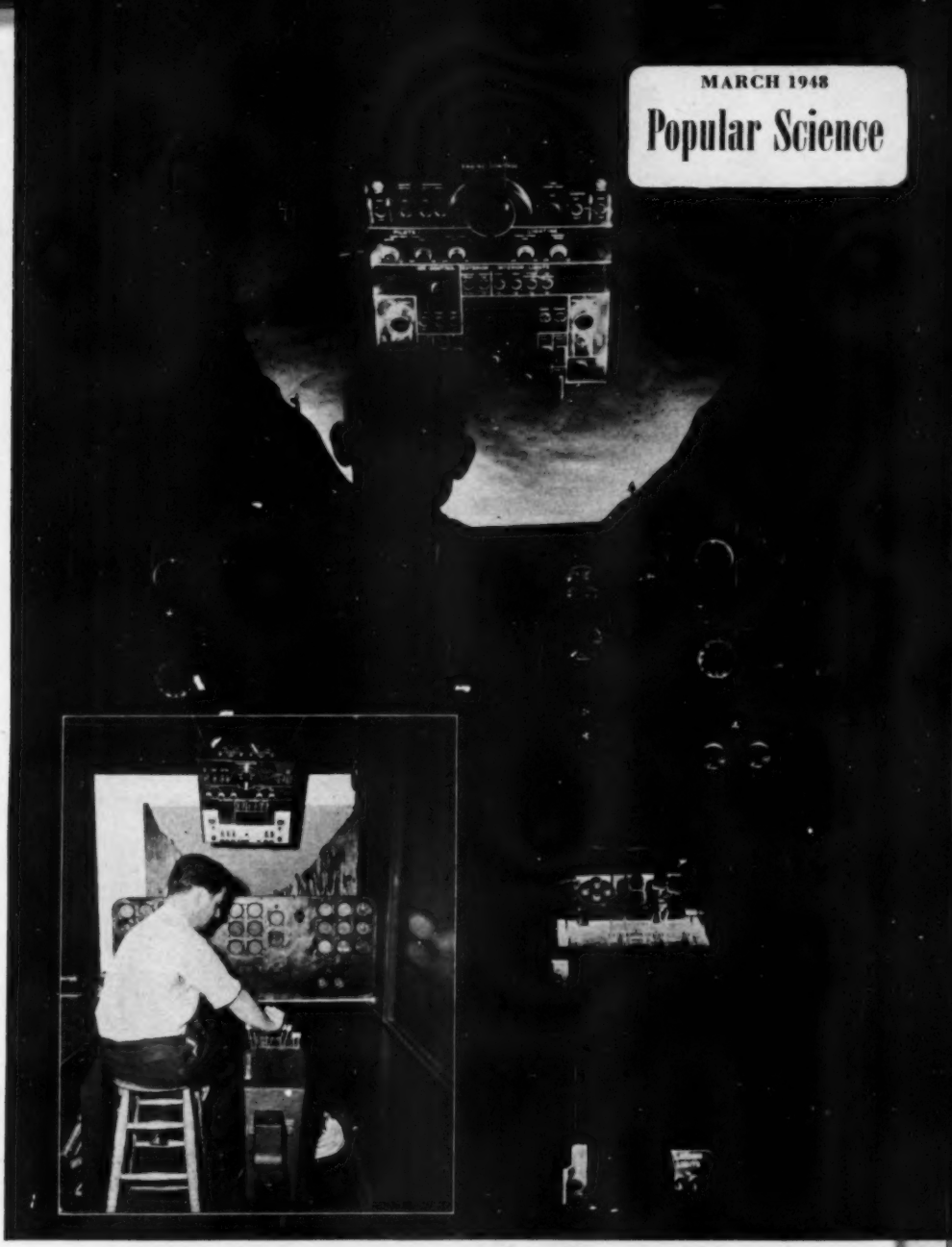
When acoustic scientists at RCA Laboratories want to study the actual voice of an instrument, they take it to this room. What they hear then is the instrument itself—and only the instrument. They get a true measure of performance.

Information gained here is part of such advances as: The "Golden Throat" tone system found only in RCA Victor radios and Victrola radio-phonographs . . . superb sound systems for television . . . the true-to-life quality of RCA Victor records . . . high-fidelity microphones, clear voices for motion pictures, public address systems, and interoffice communications.

Research at RCA Laboratories moves along many paths. Advanced scientific thinking is part of any product bearing the names RCA, or RCA Victor.

When in Radio City, New York, be sure to see the radio, television and electronic wonders at RCA Exhibition Hall, 36 West 49th Street. Free admission. *Radio Corporation of America, RCA Building, Radio City, N. Y. 20.*

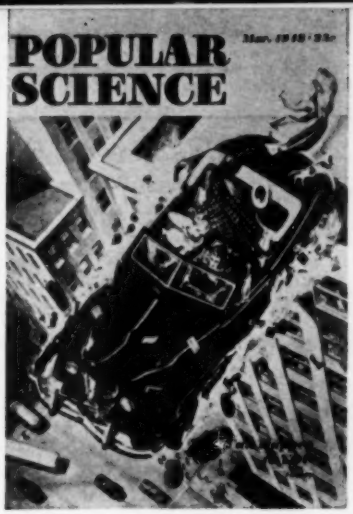
RADIO CORPORATION of AMERICA



Night Flight to Nowhere . . . Heading through a canyon in a darkened cockpit, this pilot has nothing to worry about except better night vision for other fliers. Cockpit and canyon are make-believe, as shown in inset; they were devised by Boeing to test instrument-illumination systems. In a light-tight room, pilots look from glowing instruments to a vellum "sky," try to spot movable trees on the canyon walls to see how long it takes their eyes to become adapted to conditions beyond the windshield.

This Can Happen to YOU...

This month's cover painting is an illustrated statistic. Driving 30 miles an hour is as dangerous as driving on the roof of a high building! If you hit another car head on going at the same "safe" speed, it would be like driving off a nine-story building.



Good Driving Is a Habit

...How to teach your family the Seven Keys to Safety

By Devon Francis and John F. Stearns

THE driver of a suburban bus outside Detroit was rolling along at a moderate rate the other day when suddenly he hauled on the wheel and swerved. The maneuver was puzzling. Except for some snow-covered cars parked by the right-hand curb, the road was clear.

As I stepped off the bus I asked him about it.

"Oh, that!" he replied. "Well, as we came up to that line of parked cars, I saw the snow on the hood of one of them begin to slide off. I figured his engine was running and maybe he was getting ready to pull away from the curb. I wasn't taking any chances."

That bus driver was a good driver. He made good driving a habit. He knew he had to. It's no longer possible to make each move in driving a conscious move. Speeds have become too fast for that. Stopping distances are too great. Safety on the highway demands practice until the proper reaction in an emergency becomes automatic.

The first thing to teach your family about the operation of the family car is that good driving must be habitual. Good driving includes keeping a constant lookout for what the other fellow is going to do.

Slip into the right-hand front seat of the family jalopy and have your student settle himself comfortably behind the wheel. We'll assume that he knows the rudiments—how to depress the clutch, shift, brake, and steer. Knowing how to manipulate the controls is the least of knowing how to drive. Now let's take it from there.

Pulling from the Curb

Make your student keep his clutch depressed until he has looked backward out of the window and forward up the street for other cars. Don't let him rely on his rear view mirror. It only shows about three-fourths of the road. Explain that to him. You know that, but he doesn't. And watch out for pedestrians, too. Stick out that hand. Other motorists must know what

How to Spot Trouble *Before* Trouble Comes

A GOOD instructor teaches students to keep an eye peeled for trouble. It's the bad drivers who cause accidents. They are responsible for more than eight out of every 10 collisions. What's the fellow at the wheel of the other car like? Is he inattentive, careless, discourteous? "Driving ahead of yourself"—meeting an emergency before it develops—simply means watching for the numerous clues to bad driving around you. The behavior of a left front wheel can be a warning of a turn in the absence of a hand signal. So can a drop in speed. Now take a look at these cues to trouble.

The sleeper—He's in the next car ahead—probably daydreaming if not worse. It's a sure bet he'll miss a hand signal from the first car. Here absent-minded driving is your cue.

The gabber—Always an accident getting ready to happen, he's a conversational expert on driving, politics, women's hats, and finance. A glance through his rear window gives your cue.

The cigar signaler—Look out! He's going to turn! Oops, sorry, he's just ash-flipping—No! He's slowing down—he *is* turning. Your cue is obvious. Stand clear of this character.

The stiff-necked starter—He has hardening of the neck muscles. An individualist, he darts from the curb into traffic without looking back. Smoke from his exhaust is your cue.

The southpaw artist—Has a habit of stepping out into oncoming traffic on the day after he has let his insurance lapse. Any door being opened on the left is your cue.

your car is going to do *before* it does it. It's too late after the crash. Ease out, now, in low. Shift carefully, accelerate slowly.

Make your student develop the habit of driving ahead of himself. Say to him, "Imagine you're sitting on the front bumper. You'd keep looking ahead to see what was coming, wouldn't you?" There's a car at the curb. Its exhaust pipe spits a puff of smoke. The engine must be running. Its driver may pull into the street. Ease by, watchful. There's another car parked just ahead of it. Its front wheels are turned out. Is it going to pull away from the curb?

A kid's ball bounces into the street. Use the brake. Don't wait to see if a kid follows. Take that for granted. Slow down.

"Rule Number One at intersections," you tell your student, "is that a yellow light means slow down. No light at all means slow down. A green light means slow down. At intersections just slow down! It's healthier. Look left first, since the line of cars you'll meet first will be coming from the left. Make it a habit.

"Watch every other car in the intersection and every car that can reach the intersection before you leave it. Some dope in a hot rod may come screeching through. Look at that line of cars to the right now. If one of them tries to pass another one inside the intersection, put out your hand and stop. Let the fool get out of the way before you move. And in stopping, don't jam on the brake. The car behind you may smack into your rear end. That could well-nigh break your neck."

Tell your student to make it a habit to keep his eye peeled for clues to what the other fellow is going to do. Front wheels on the roll telegraph a lot of information. The car coming into the intersection just opposite you is slowing. Its wheels turn just a shade. Its driver is going to make a turn. Easy, that may mean a full stop for you to let him get out of the way.

Stop for a Talk

When you get through the intersection have your student pull over to the curb for a talk. How fast was he going as he approached the intersection? Twenty. That sounds safe. But does he have any idea how far his car would travel in a half-second at 20 miles an hour? The answer is *fourteen feet*. And what's the half-second for? Well, that's how long it would take him to react to an emergency. Fourteen feet can be the difference between safety and collision.

A moment ago you warned him against drivers who tried to pass within the intersection. Why? Well, supposing he himself tried to pass another car that had slowed down. The other car may have slowed down to let a pedestrian cross in front of him. Could *he* avoid the pedestrian? Or the other driver may have been looking for a cross street. If he found it, the chances are he would swing hard left. How much chance would he have to avoid a collision? Or the other driver may have spotted a car on the cross street coming in fast. If your student had been passing, would he have been able to stop in time?

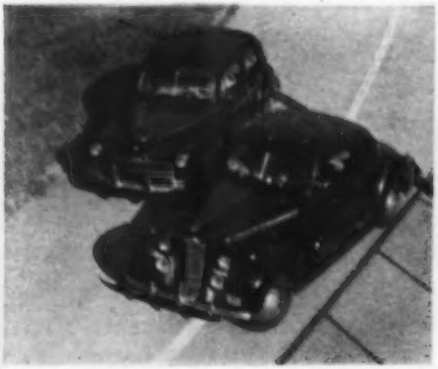
Try another intersection. Here, a streetcar going in the same direction stops as you

This was the inevitable result of driving too fast *for conditions*. Up ahead, two cars collided. Nine other motorists couldn't stop in time. The cost: seven drivers were injured.

Meet the Road's Five Common Trouble Makers

LOOK around you. The traffic on any highway is chock-full of lessons on how *not* to drive. Every day more than 25,000 drivers are involved in traffic accidents costing the lives of upward of 100 persons—almost all due to bad driving. The cost in automobiles destroyed and damaged each year would pay for teaching 40,000,000 people how to drive safely. The American Automobile Association says we should talk about the *art* of driving instead of the skill of it. Good driving includes: skill, knowledge, attitude, and judgment. These pictures show the commonest violations of the art of driving.

The curve passer—This fellow shares with the hill passer the title of chief jerk on the highway. When he comes along, pull over to the right and slow down. Be smart and let him go by.



The cutter inner—You'll find this suicide-minded dope on every highway. There's nothing you can do about this menace except to give him as wide a berth as the road permits.

The mind changer—This bright specimen darts into a turn from the wrong lane. And when he gets hit, he screams that he had the right-of-way. Just slow down and let him by.

The bumper hugger—Any sudden stop and this one smacks right into you. A slow-to-learn-type, he usually sports a caved-in radiator. Here again, slow down. Make him pass you.

The line rider—Loves to miss oncoming traffic by inches. Never heard of the laws of impact. Don't try to cure this fellow by swerving toward him. Just give him lots of room.

approach. Ask your student, "Know what may happen if you barge on into that intersection? Another car may come in fast on you from the left. The streetcar hides it. What'll the other driver do—go under you, over you, or through you? Get the habit: STOP."

Railroad tracks are intersections too. Roll your student up to a crossing. Where it says stop, it means STOP. Trains use wheels too, and anything on wheels is potentially dangerous. Single track or double track? Look both ways. The tail end of that passenger train rumbling by may hide the head end of a freight a hundred feet away. Wait. You may spend 30 seconds and save your life.

Turning

Practice making turns. Tell your student he must learn a habit of signaling. Make him learn to work his way into the proper lane minutes before he intends to make a turn. He must ease off on the accelerator several hundred feet ahead of his turn. He'll learn that the braking power of his engine compression with the power off is one of his chief assets in car control.

To make that turn he must signal. Say to your student, "put out your hand. For a right turn, you must be in the right lane. For a left turn, you must be in the left lane. That's elementary, but make it a habit. To change lanes you've got to signal. You've got to look behind you for following traffic. You've got to signal again for your actual turn. That's just protecting yourself from the other fellow."

Now for the turn. It's you talking: "Swing left just short of the center of the intersection, if the law permits. That leaves room for drivers coming from the opposite direction who also want to turn left. Complete your turn just to the right of the cross street's center line. See how this keeps the number of traffic lanes you have to cross at a minimum?"

Right turns are money in the bank. Start from the right lane. Complete the turn in the right lane.

Passing

Take your student out on the open road. Here's space. He's got a lot of horsepower under his foot and he aches to use it. If the road's clear, let him. It satisfies an urge.

He's going to overtake cars going his way that are jogging along uncomfortably slow. He wants to pass. What's a safe passing speed? What's a safe passing distance? Those are hard ones to answer. But maybe this will help:

If your student is going to pass a car going 40 m.p.h., he should have about 1,000 feet—or about 55 car lengths—between him and any car coming from the opposite direction before attempting it. And there's a catch. These conditions hold good if the oncoming car is making about 45. They hold good if the pavement is dry, if the road is straight and level. If the pavement isn't dry, tell him to double his estimate just for safety.

If there's a hill or a curve, tell him to make it a habit to let up on that accelerator and keep his position.

He makes an experimental pass. The car gets by all right, but he cuts in too sharply in his anxiety to get back into the right-hand lane. "Wait," you have to tell him, "until you can see some part of the car you've just passed appear in your rearview mirror. Then ease back into your lane."

There was something else. Did he forget something? He looks blank. Did he look behind before he started to pass to see what traffic was following him? Did he put out his hand? No, he didn't. Let those answers ride on the double zero for the next spin of the wheels without saying anything more. It's effective.

"At night," you can tell your student, "passing is more critical. Make it a habit to allow yourself more room. Be more critical of your judgment of speed. Flick your headlights to tip off the car ahead that you're going around him."

Speed

That speed itch is eating at the ball of your student's right foot. You know it. The needle on the speedometer keeps creeping up. Let him go. Wait until she hits 50. Then tell him to brake to a stop as fast as he can and still keep the car under control.

He starts braking. "Did you look behind?" you ask him. "Did you put out your hand in a slow signal?" No, he didn't. Okay, just a reminder to make it a habit.

As the car snubs to a halt, ask him if he has any idea how much distance he ate up in stopping the car. No, he hasn't. Then explain it to him: "It took you a total of almost a full city block to bring this jalopy to a stop from 50 miles an hour. But there's something even more important—do you know how far your car traveled from the

time I told you to stop until your brakes began taking hold? No? Well, it was 55 feet, more than the width of a city lot. It took you that long to react."

It will help that itchy accelerator foot if he forms the habit of thinking of a car as a huge steel flywheel. The faster it goes, the more kinetic energy it builds up. The kinetic energy goes up as the *square* of the speed. *It's 25 times as great at 50 miles an hour as it is at 10.* The only way that kinetic energy can be dissipated fast is with the brakes.

And here's another valuable habit to form—have him keep thinking of driving conditions. The trouble with most drivers is that they go *too fast for conditions.* Visibility, for instance. There may be fog, rain, or snow. Ever hear of a pilot taking his personal plane off the ground when the airport was fogged in? Okay, take a cue from people who fly airplanes. Even 10 miles an hour may be too fast under certain conditions.

What's the condition of the road? Ice? Snow? Rain? What's the condition of traffic? Light? Heavy? What's the condition of the terrain? Hills? Hairpin curves? What's the condition of the car? Brakes okay? Headlights bright? What's *your* condition, Mr. Student? Sleepy? Worried and preoccupied?

Remember, teacher, you can't do your job in one lesson. You are trying to form a habit. So short, frequent sessions are best. And watch yourself: don't *you* get excited. Keep your voice deliberately low and calm.

As your pupil progresses, keep him at the wheel longer. Let him get confidence, but when he becomes over-confident, as he will, check him gently. Let him get away with two or three blunders. *Then* tell him.

That's enough for today. Tell your student to turn around and head for home. Whoops! How about a signal for that turn? Remember, make it a *habit!* END

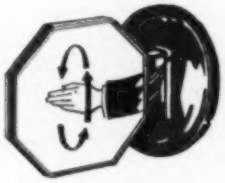
Seven Keys to Safety

4
Suspect every pedestrian of suicide.

1
Learn to judge conditions: traffic, visibility, road surface, mechanical condition of cars, physical condition of drivers.

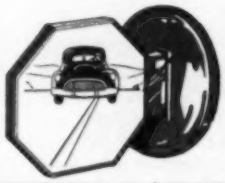
5
Slow down at yellow lights. Slow down at no lights. Slow down at *green lights. Every intersection is a crash point.*

2
Don't forget that it isn't how fast you go, it's how fast you can stop. Stopping = braking distance + your reaction distance.



6
Signal *your* intentions. Protect yourself from the other fellow.

3
Keep one (1) car length behind the other fellow for every 10 miles on your speedometer. Double (× 2) it for wet days. Double that (× 4) for snow or ice.



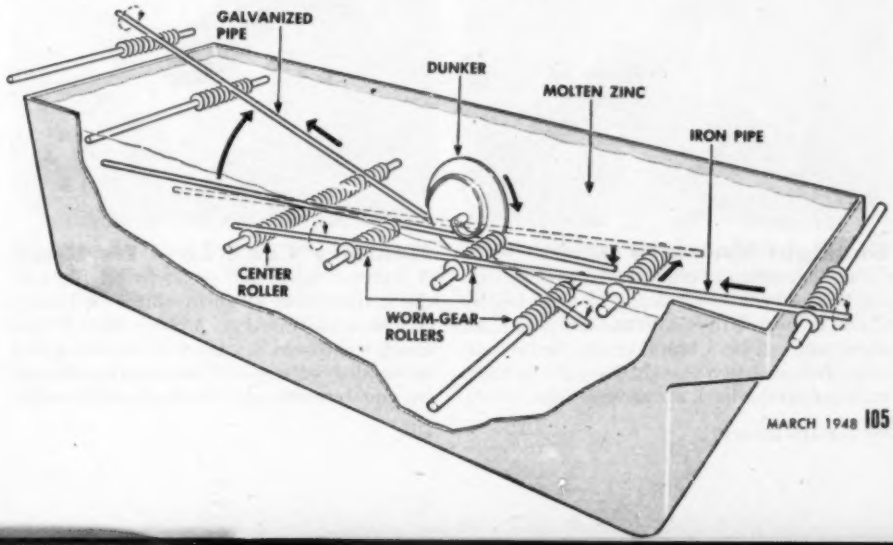
7
Expect the worst from the other fellow.

The galvanizer, shown here lifted above its tank, uses worm rollers to move pipe through bath.

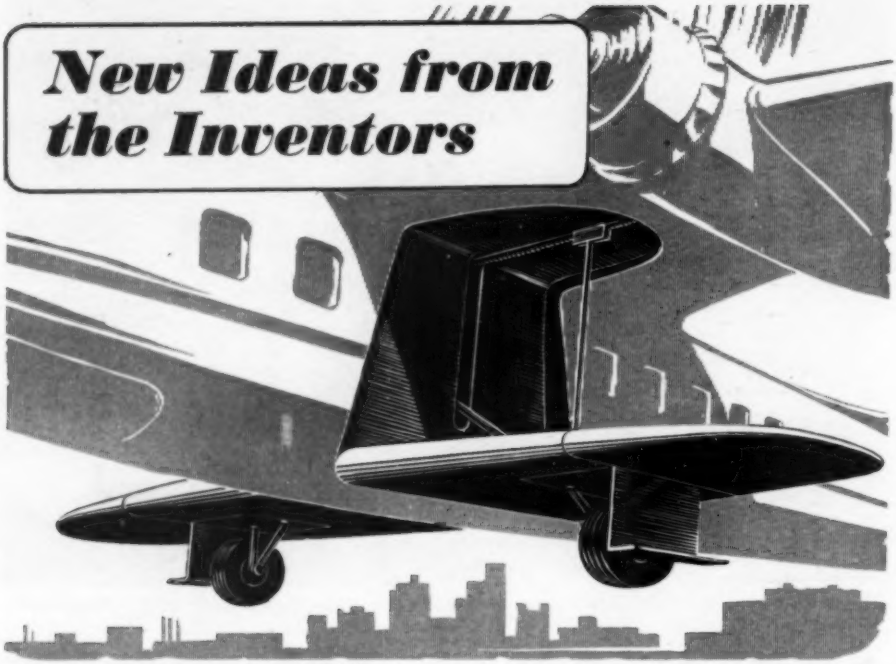
New Galvanizer From Home Shop

THANKS to a home workshopper's ingenious machine, galvanized pipe can now be turned out automatically, in volume, with a bright, even coating of zinc. Paul Ely worked two years on a model in his basement shop, then showed it to his employers, the National Tube Co. Enthusiastic, they halted work on a different unit in favor of Ely's.

The secret lies in a set of worm-gear rollers that keeps the pipe moving through the zinc bath continuously, yet withdraws it so gradually that excess zinc has time to run off. The worm spins the pipe (for uniform coating) and shifts it sideways until it drops off one end of the roller. A dunker cam then pushes the back end of the pipe down into the zinc bath, pivoting it on the center roller. This brings the front end up to an outgoing roller that moves it out of the tank. The process can handle 600 tons of two-inch pipe in 24 hours.



New Ideas from the Inventors



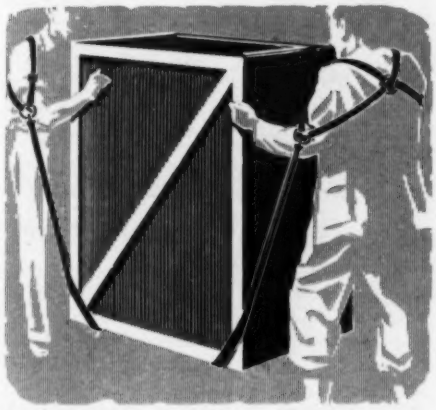
Winged Wheels Add Lift. When this plane lets down its wheels, it also sprouts an extra pair of wings. Patented by Jack S. Conner, of Los Angeles, Calif., the stub wings are designed to give increased lift for landings and take-offs. Hinged in two sections, they fold half against the fuselage and half into the under part of the main wing.

Gunsight Shows in Dark. If you do much hunting at night, you'd probably go for this self-luminous gunsight invented by Clyde B. Ferrel, of San Francisco. The front sight, marked by a luminous plastic, is centered between two upright bars of the same material on the back of the rear sight.

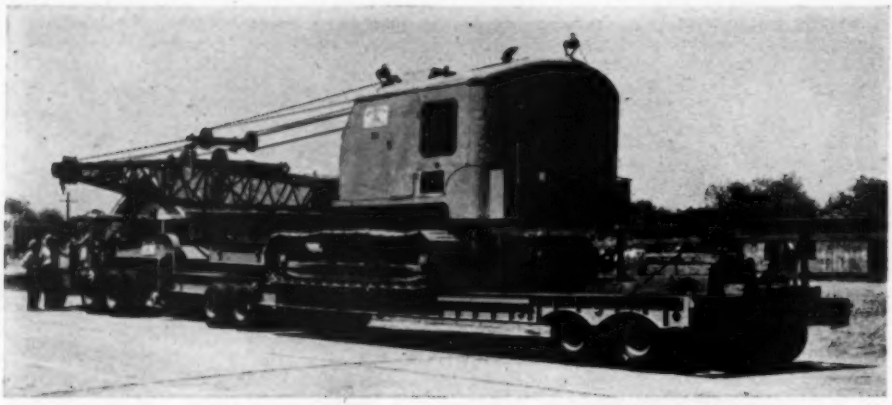
Hammer Can't Lose Its Head. A hammer head that won't fly off the handle is the object of an invention of Francis A. Lucia, of Brooklyn. A cover plate is held down tight over the head by an elongated, spread-legged staple whose ends are secured by countersunk nuts at the handle's sides.

Traction Aid Clamps On. You could put on this tire traction device without having to move or jack up your car. Used instead of ordinary chains, it consists of two hooklike arms connected by a steel spring. They are clamped over the wheel, pulled together, and locked in place. It was invented by Herbert B. Harrop, of Middlebush, N. J.

Frame Is Slid in Place. Two sheets of glass, grooved on the edges, and four metal tubes, slit along one side and mitered at the ends, make this ingenious picture frame patented by Jean Le Boulengé, of Brussels, Belgium. The picture is inserted between the sheets and the tubes slipped on.



Harnesses Ease Lifting. To give you a lift as well as your load, William A. Theal, of Sullivan, Ind., has invented a pair of shoulder harnesses that allows two lifters to support heavy loads between them. Besides dividing the weight evenly, they eliminate tiresome stooping and leave hands free.



Big Stuff on the Move

THIS massive, 100-ton-capacity road hog has an underpinning of 42 truck-tired wheels. It measures 75 feet from the tip of its truck to the tail of the trailer. In the photo above it is shown carrying an 80-ton Diesel-powered drag line and shovel, with plenty of room to spare. Trailer and goose neck alone of this Fruehauf job weigh 43,-400 pounds. Hauling of loads up to 100 tons is made possible by the great length of the trailer, which distributes the load between the front and rear groups of tires.

Japs Greet Midget Car

THIS startled MP has seen everything. Luckily there wasn't any traffic to snarl up when the Jap inventor drove his tiny, electric-powered car down a Tokyo street. Named the "Baby Star," it is about one-fifth the size of an ordinary automobile. A 400-watt motor, developing one-half horsepower, runs it for three hours at 25 miles an hour before the batteries need recharging. It can be converted to use gasoline. A homemade job, the wheels of this bantam auto were taken from dismantled airplanes. It is supposed to be a two-seater.

Mineral Facts on File

X-RAY photographs such as this scientist is examining, are the "fingerprints" of minerals, and like those of human beings, no two are alike. On file at Harvard's Berman Memorial Library are photographs of almost all of the possibly 2,000 known minerals, ready to identify unknown specimens. New minerals will be added as discovered.

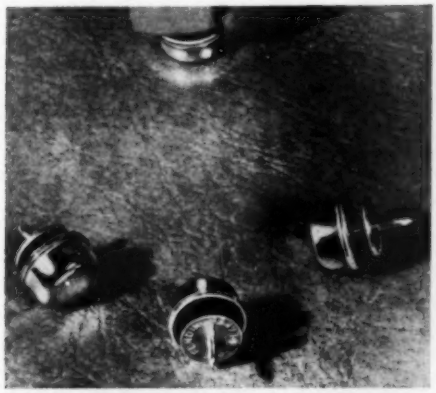
Previously, difficult chemical tests were required to identify minerals. Now, a tiny sample is finely powdered and an X-ray photograph taken of its atomic structure. The resulting picture shows a series of concentric dark rings. By measuring the distances between the rings, and comparing them with a reference catalogue, the material can be identified in a matter of minutes instead of hours.

Telegram Prowl Car

PICKING messages out of the air instead of criminals off the streets, this new-type service car speeds up home delivery of telegrams. When a main Western Union office receives a telegram for you, it is ultra-short-waved to a "Telecar" assigned to your neighborhood. The driver picks up the facsimile message from the Telefax recorder located under the dashboard, as shown above, reads the address, and drives to your home to deliver it. Should you have a reply, he'll transmit it by radio from his car.

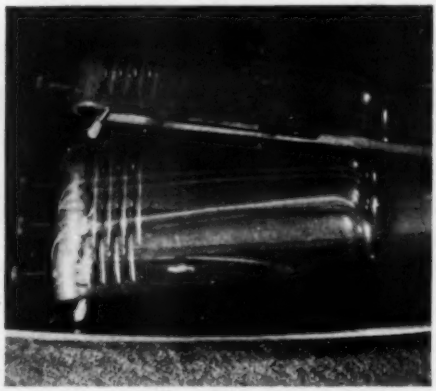
Gun-Range Lead Mining

THIS novel dry-mining contraption recovered 13 tons of lead from the grounds of a Lewiston, Idaho, gun club in 20 days. It consists of two box sieves rocked by an old washing-machine gasoline motor. A coarse gravel screen in the top box sifts out large stones and weeds. The lead pellets, deflected by baffle plates, collect at one end of the lower sieve, the bottom of which is covered with window screening. In photo above, the clean lead is being dumped into an ammunition box for resale.



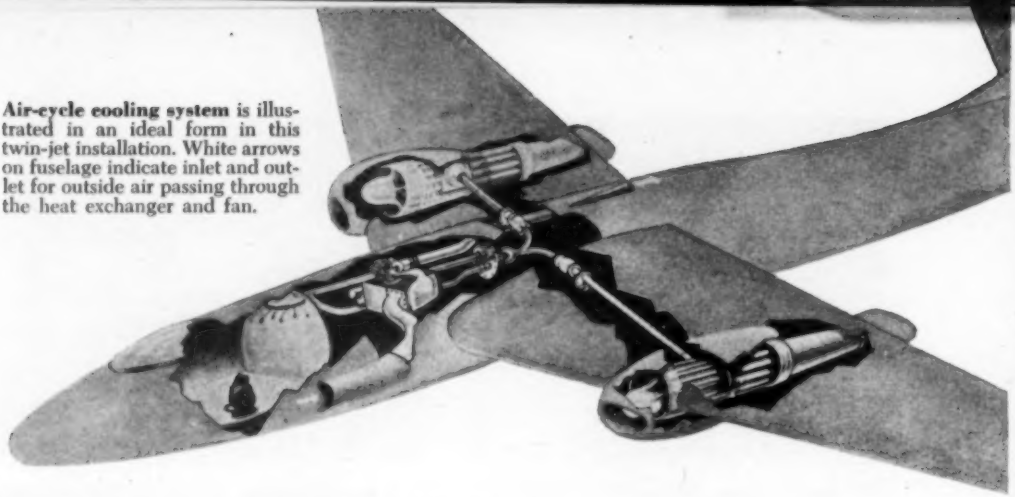
No More Wobbly Tables

How often have you suffered from table wobble? Cheer up, here is a gadget that automatically adjusts table-leg lengths to uneven floors. Inserted in leg ends, the Levelmatics shown above have a piston inside a cylinder filled with GE's famous bouncing putty (PS, Jan., '45, p. 97). The manufacturer, Blake Industries, of Detroit, explains that the magic putty acts as fluid does in a hydraulic mechanism.



Needle that Bounces

THIS phonograph needle won't break records, or even crack them. If inadvertently dropped on your favorite platter, it simply bounces a few times, then settles down in the groove, as shown above. The shock absorber is a tiny nylon bumper connecting the duraluminum shank with the steel-spring needle tipped with precious metal. This new needle, claimed to be good for 5,000 plays, is made by the Duotone Company, New York.



Air-cycle cooling system is illustrated in an ideal form in this twin-jet installation. White arrows on fuselage indicate inlet and outlet for outside air passing through the heat exchanger and fan.

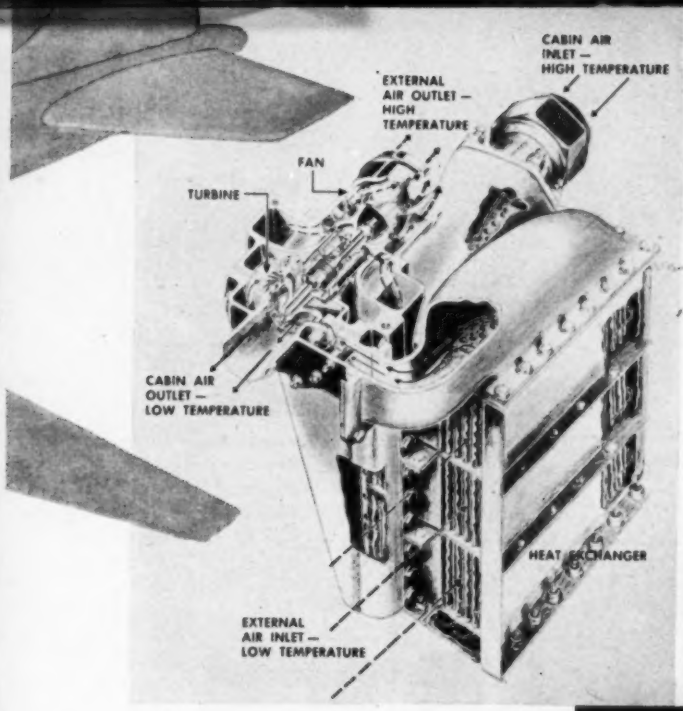
Cooling "Hot" Pilots

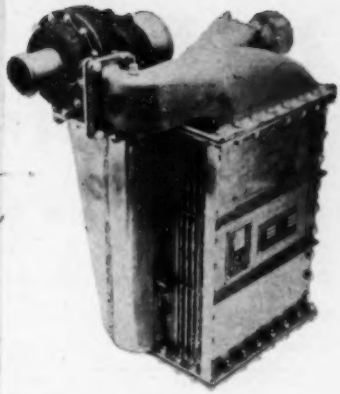
HUGE jet and rocket engines enable pilots to race the speed of sound, but a turbine no bigger than your fist keeps them alive while they do it. With a half-ounce rotor whirling more than 100,000 r.p.m., this midget takes air from the hottest part of a high-speed plane, turns it into a near-freezing blast, and keeps the cockpit from turning into an oven.

Without such super-refrigeration, even jet fighters' cockpits would be unbearable. In planes like the Douglas Skystreak and Skyrocket, temperatures would reach 180° F. at 650 m.p.h. At sonic speed (760 m.p.h. at sea level), the cockpit might hit the boiling point—210°. (For a report on how much heat a pilot can stand, see page 130.)

The miniature turbine, linked to an air-

Whirl tests in a sunken, wood-lined pit tear rotors apart to determine their bursting speed. Tiny rotor of the air-expansion turbine will stand 140,000 r.p.m. Here a larger rotor is put in pit (above, left) and disintegrated (above, right). The wood lining is chewed to pieces.





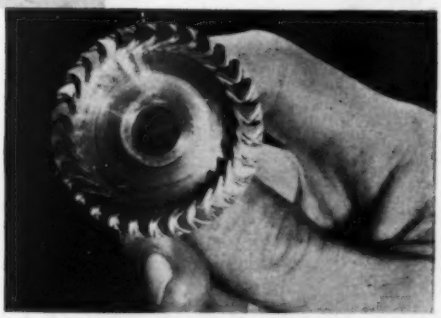
Turbine and heat exchanger make a compact package. Cutaway at left shows how outside air (broken arrows) and air from jet's compressor (solid arrows) cross trails in the exchanger. Turbine alone drops temperatures 135°; total drop in both units is more than 450°.

to-air heat exchanger, is the answer. Developed by the AiResearch Manufacturing Co. in a 16½-pound package, the refrigeration unit draws air from the compressor of a jet engine at 500°, spews it into the cockpit at 40°. This brings the cockpit temperature down to where you can live with it.

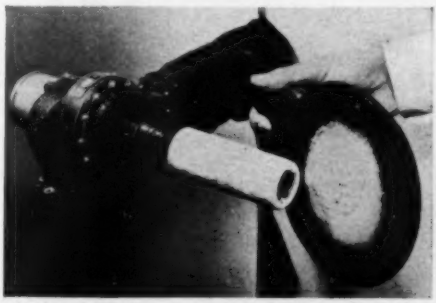
The hot compressed air first passes through hundreds of small tubes in the heat exchanger. A stream of air drawn from the outside of the plane flows around these tubes and carries away most of the heat of the pressurized air. Cooled but still compressed, this air then flows into the turbine chamber, where it expands with a rush and loses a lot more heat in the process.

Blasting through a ring of tiny nozzles at velocities up to 800 m.p.h., it drives the 1½-inch aluminum rotor, which in turn drives a fan at the other end of a connecting shaft. The fan performs double duty: it discharges the now-heated outside air, and in doing so imposes a load on the rotor that keeps it from ripping itself to bits.

The refrigerator assembly needs no power except that of the compressed air. Its only moving part is the rotor-fan element. And as a final advantage, it can be by-passed with the flip of a valve to let hot air flow directly from the compressor into the cabin —if a "hit" pilot ever gets cold. END



Vanes of tiny rotor, made of 24ST aluminum, are routed and finished with dental drills, running in an oil bath. Finished rotor is 1½ inches in diameter, weighs half an ounce.



Working under seven pounds' pressure, an air-expansion turbine takes in air at 150°, spews it out at a frosty 15°. Under some conditions, pilots actually sit in this baby snowstorm.

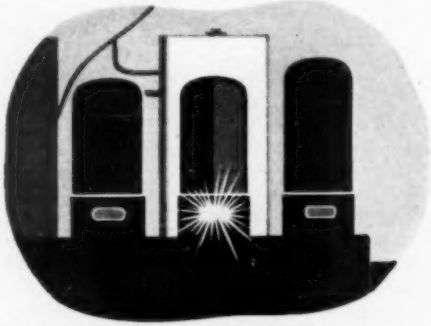
I'd like to see them make . . .

Drawings by Lester Fagans

Everybody has his own pet idea of some gadget he would like to see in general use. What is YOURS? *Popular Science* will pay $5.00 for each one published. Use government postcards only. Contributions cannot be acknowledged or returned.

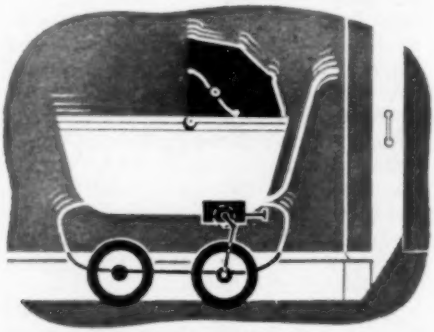
Butter-Melting Toasters. How convenient it would be if a toaster was designed to mount flush with the table top. A butter melter and spreader brush would help too.—D. A. Walker and G. H. Laird.

Paint Bombs. If paints of various colors were packaged in expendable compressed-gas cylinders like insecticide bombs, anyone could quickly do a neat spray job without fuss and bother.—Tom Tenny.



Tubes That Tell They're Bad. A new fuse has a built-in neon bulb that glows when the fuse is blown. The same idea could be applied to radio tubes, indicating a burned-out filament.—Jim Ruffner.

Built-in Washboards. Metal tubs with the front side ribbed in washboard fashion would be a big help to the housewife. The washboard then would always be in position.—Mrs. W. P. Dunaway.



A Carriage Rocker. My baby always begins to cry when the carriage stops. It would be nice to have a spring mechanism linked to the axle, rocking the baby while I shop.—Mrs. Blanche Gorman.

These Safecrackers Can Get Away With It

And because they do, new protective alarms and detectors are making it tougher than ever for the bore mobs.

By Philip Gustafson

SOME of the world's most expert safecrackers are working overtime these spring nights under the appreciative and approving eye of police departments from New York to California. Whenever they crack a particularly tough safe the peace officers applaud, for these experts are helping battle the biggest crime wave in American history.

They are legal burglars. They operate on the side of the law, not against it. It is their job to outwit the underworld. That job has become harder since shortly before the war ended. Where two burglars roamed the streets in war days, three are on the loose now.

The legal cracksmen are employees of Underwriters' Laboratories, Inc., in New York, Chicago, and San Francisco. They jimmy safes so that better safes can be built, but they do far more. They break into vaults, concrete strongboxes, and business buildings. They pry open windows, short-circuit alarm systems, and saw their way through heavy steel rods barring the way to deposits of valuables. They drill, hammer, rip, and blast.

The end-product of their work is to show up the weaknesses in burglar protection systems.

In their spare time they inspect burglar

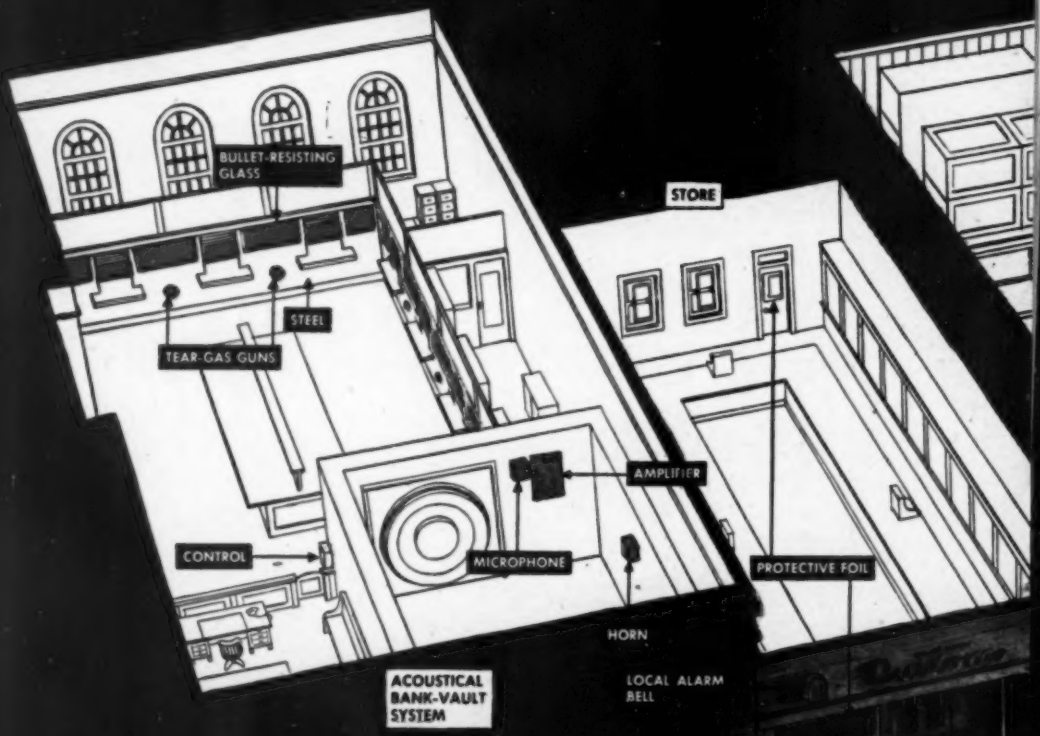
alarms in the field, and last year alone visited something like 2,000 mercantile establishments in all parts of the country.

Edward N. Snowdon, senior in the New York office of the Laboratories, has been cracking safes for 25 years. He and his associates even make it their business to have a pretty good idea what burglars will be thinking three and four years hence.

Burglar alarm equipment is Snowdon's main interest. These alarms are of two classes. The first is the local alarm, with which nearly everyone is familiar, where a bell rings on the outside of the building to notify police or chance passersby that someone is trying to break and enter. The second type is the central-station system. Row on row of fine copper wires cover or are embedded in walls at intervals of only a few inches. Doors and windows are bordered with strips of tinfoil. Wires and tinfoil are hooked up by trunk-line cables with alarms in the protection company's nearest central office—a place closely resembling a small-town telephone exchange. These systems are so sensitive that a current change as small as a thousandth of an ampere is enough to set them off, even though the circuit is made up of thousands of feet of copper wire not much larger than a horsehair.

Let a burglar hit a wire or tinfoil and all hell starts popping. Bells ring, lights flash and gauges go crazy in the central station. Police radio cruisers and carloads of guards

Below, you get an inside view of a variety of "bugs," tailored for four individual problems.

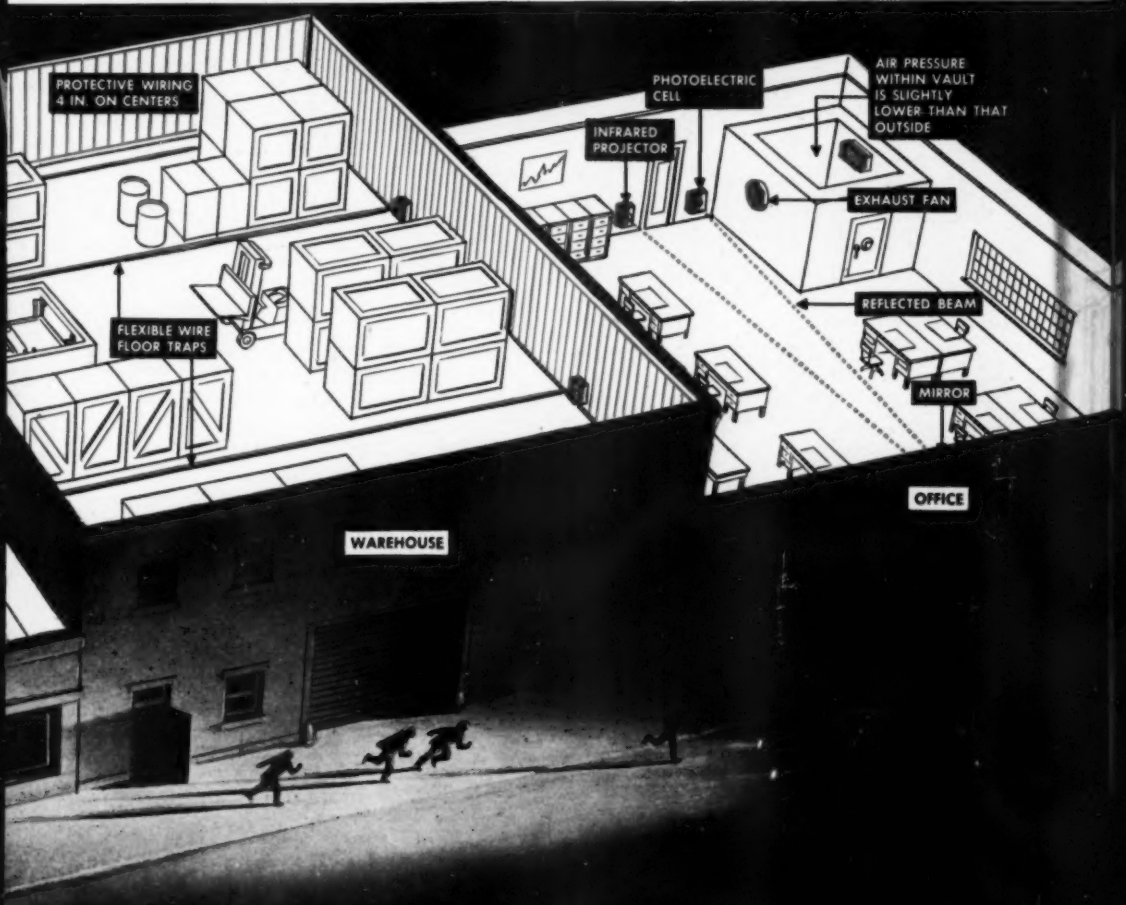


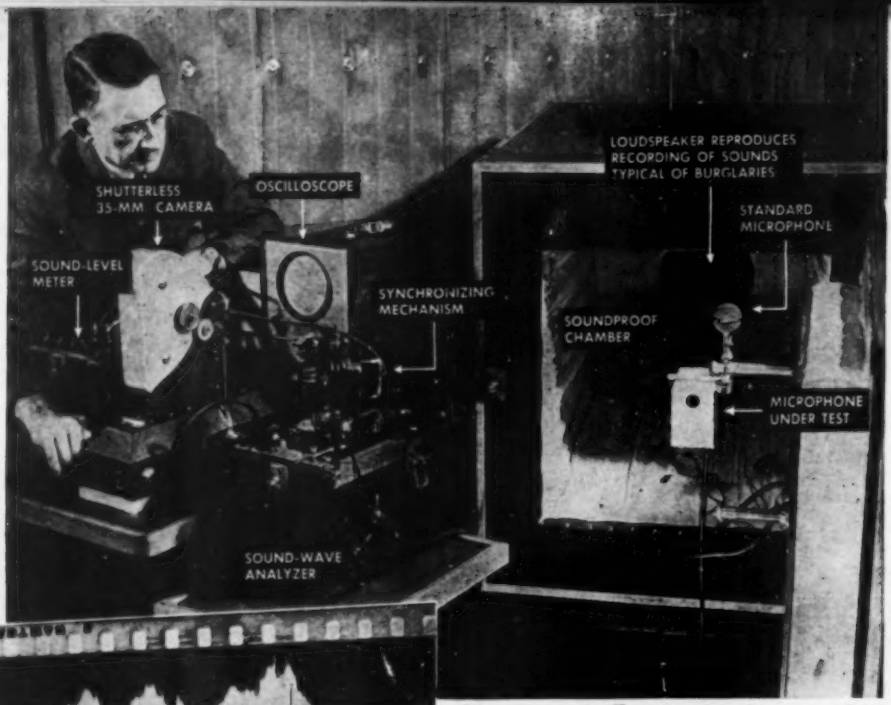
speed with sirens screaming to the scene of the break. If it's a Grade A alarm, the burglar had better fade in less than 10 minutes or he's a gone goose.

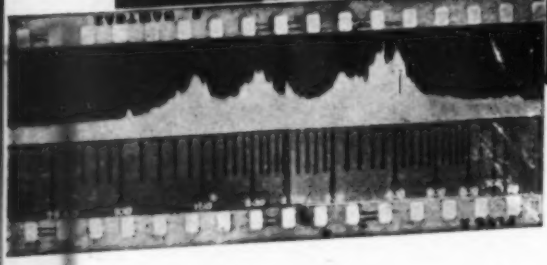
Burglars are always trying to sap through unguarded wall areas. Cost of construction and maintenance, as well as factors of appearance—in the case of show windows—have sometimes prevented the wiring of all floors, ceiling, and display space on commercial property, so a lot of the alarms still don't provide complete protection. A few professional burglars consider themselves smart enough to take advantage of this deficiency. These days, however, a great many such self-confident thieves are walking into the invisible beams of the new "electric eye" alarms, which are also hooked up in circuit to ring in at the central station. Most of these alarms simply apply the principle of the photoelectric cell by which infrared light is focused in a beam two or three inches thick that can be thrown anywhere from 100 to 500 feet with maximum effect. The invisible infrared beam can be reflected by mirrors and interlaced between piles of merchandise in an ordinary warehouse like the strands of a "cat's cradle." Unable to see the light, the thief does not know what he has walked into until the guards from the nearest protective station swoop down on him with drawn guns.

"Since it is difficult and costly to guard all means of entry to a large business or storage

The protective devices are shown in red. Some slow the burglar up, while others tattle on him.







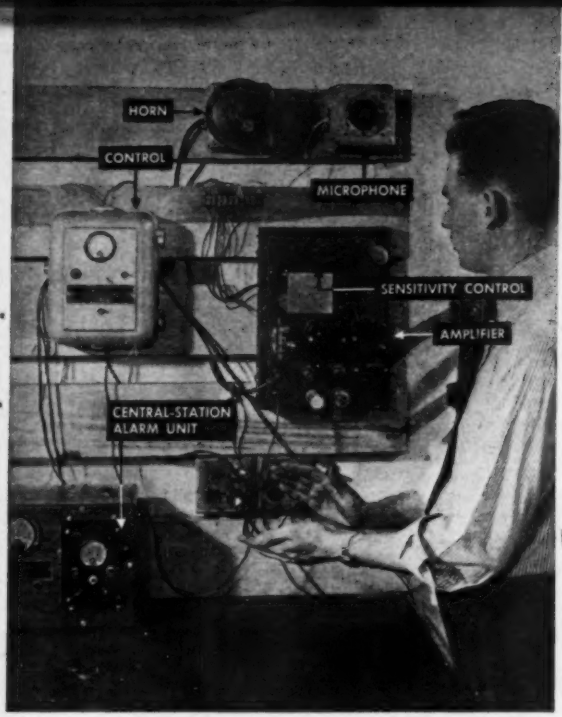
The camera-oscilloscope rig, shown in photo above, was used by Edward N. Snowdon of Underwriters' Laboratories to produce the spectral analysis of sound at left. It shows that the noise of an electric drill in concrete lies in frequency range of 75-750 cycles per second. Apparatus was designed and built by Underwriters' Lab. engineers, as was the synchronizing system.

building," Snowdon explained to me, "there is a growing tendency to concentrate protection on the valuables that the burglars might attempt to steal. Here, some of the new electronic principles are being widely applied."

One of the most interesting is the new "telapproach" mechanism, which for all practical purposes throws an electrical field around the safe or other piece of property to be protected. Known to the trade as the "body capacity system," it makes use of an "antenna" like the old-fashioned radio. Then any interference, such as a man walking near the safe, destroys the equilibrium of its balanced oscillating system, and the "telapproach" turns in a "squawk" at the central station.

Also in common use today is a "burglar alarm with ears." Vaults are equipped with microphones so sensitive that an alarm can be set off literally at the drop of a pin. Ordinarily, however, they are not set to so fine a pitch, but they will go off readily at a clap of the hands. These microphone alarms are really very choosy mechanisms. They will turn up their noses, for instance, at the rush of a train, but will set up an awful howl in the central station if anyone turns on an acetylene torch or does any gentle hammering in their neighborhood. Close kin to these microphone alarms are the highly developed vibration detectors, which actuate an alarm at any attempt to drill or burn through a vault wall or door. These too are very particular little gadgets that can be set to ignore traffic rumbles.

Snowdon and his assistants test these microphonic mechanisms with phonograph records. On occasion, these engineers are called upon to make tests on permanent structures in the field. With their recording and transcribing equipment, they in effect bring the mountain to Mahomet. Painstaking recordings are made during these realistic burglary tests, with all pertinent data accurately noted. These faithful recordings are then played back in the laboratory where



An acoustical bank-vault system is tested for sensitivity. Even a handclap will activate the alarm, but the sensitivity can be adjusted so that it isn't set off by ordinary noises near the installation. Horn, mike, and amplifier would be inside vault; control mechanism would be outside vault and connected to central-station alarm by regular telephone.

the process of analysis is carried out. It saves getting out the drills and torches every time a new control mechanism arrives.

One of the most interesting of the new alarms utilizes a feeble vacuum that is produced within the vault by a small fan set in the wall. Ingenious and extremely sensitive control apparatus instantly detects even such a slight change of air pressure as might be produced by making a small hand hole in any of the vault walls.

Tear gas is also used to protect vaults and safes against burglars. It is discharged automatically in the event of an attack on a door or combination by actuating mechanisms that are usually mechanical and involve no electrical controls at all.

The latest of scientific devices—many of them using new detection methods developed during the war—have already been applied to new burglar alarm circuits. These systems employ infrared, supersonic, ultrasonic, and microwave propagation. The detection devices operate by reflection, refraction, interception, and sometimes by frequency modulation. These modern burglar alarm systems are designed to radiate imperceptible energy in one form or another and the detection units respond to any interruption in reception.

When it comes to applying new inventions, the criminals have always been quick to show the forces of law and order that they have no monopoly on science. Postwar scientific crime confronted New York police early in 1946 when they arrested four youths —none of them old enough to vote—who were using walkie-talkie-equipped lookouts to warn of approaching police. The four boys were already responsible for 75 burglaries and 42 robberies, police calculated, netting at least $10,000 and possibly as much as $50,000. The 20-year-old brains of the gang was a former radio specialist in the Navy who made the walkie-talkie sets used in the robberies.

Burglar Alarm Best Insurance

What the postwar world may breed in the way of a supercriminal still remains to be seen. But the best protection for the property owner, crime prevention authorities agree, is a good electric burglar alarm that brings organized response on the run. However, due to the general apathy of property owners, as well as the cost of installation and maintenance, these alarms are used by less than 50,000 subscribers the country over. Local alarms, with the bell outside the building, total perhaps twice this number. Thus, all but a small fraction of the nation's businessmen pin their faith on locks and bars.

Though the two-way radio car is the deadliest enemy burglars ever had, police ask property owners not to leave everything to the cops.

Effectiveness of central-station alarms is shown by the latest annual figures of the American District Telegraph Company, largest alarm firm, with some 20,000 central-station installations in cities about the country. ADT reports 1,748 attempts in 1946; burglars got in 920 times and 589 were caught. But when all the returns were in, the company claimed property losses of less than a hundredth of one percent of insurable value!

"The history of locks, safes, and vaults," says Snowdon, "has been just one chapter after another of a dog-eat-dog contest between the maker of locks and the breaker; between locksmith and burglar. It's been

going on since men first began to accumulate property. And the game is still going on hot and heavy."

Each war brings its own crime wave and each crime wave produces its own particular brand of criminal, who runs wild for a while until the law chases him to cover. Police say there are plenty of good "pete men," or safe crackers, at work about the country, and they dread having a "mob" hit town because it sometimes takes two or three years to root them out. Captain Ray Maguire, Chief of New York's Safe and Loft Squad, who has been chasing this particular brand of burglar for something like 21 years, still has painful memories of a pair of expert operators who collected several hundred thousand dollars before they were put away in 1946 after a chase that lasted a year and a half.

It was late in the fall of 1944 that banks, loan associations, and business houses first began to be looted with sickening regularity all around the New York metropolitan area by what the newspapers called "phantom burglars." They just seemed to walk right in and out of the most strongly made business buildings without leaving the mark of a jimmy, a broken glass, or even a speck of dust to show how they did it. In job after job, the "phantoms" showed they knew every standard way of opening a safe by force—burn, rip, blow, and punch.

Home Workshop of Crime

Finally, the case broke when a pair of detectives from the Safe and Loft Squad spotted two men sizing up a Manhattan bank. After two weeks of intensive shadowing, Captain Maguire and his men swooped down on five-foot-five Stanley Patrek and his husky six-foot pal, Joseph Stepka, still in their late twenties, in the very act of burglarizing the Yonkers Savings and Loan Association of $15,000. The two proved to have one of the best-equipped criminal workshops ever uncovered. They were master machinists, metallurgists, and locksmiths. They had even taken jobs in war plants to brush up on the handling of the tricky acetylene torch. Their mysterious entries into banks were usually arranged days in advance, when during business hours they'd slyly remove the cylinder, or business part, of the lock and keep it just long enough to make a key. Then some night when they needed money, they'd call back and open the safe. These two were, without a doubt, the cleverest pair of burglars he has ever encountered, Captain Maguire declares.

"However, the average business building is a cinch for any good burglar," he says. "Most of the time burglars jimmy the windows or doors and go right in. Sometimes they conceal themselves on the premises at the close of business hours, take what they want during the night, and then just walk out the door. Some 'aerial' burglars swing by ropes from the roof and break in unprotected windows. And then again you get what we call a 'bore mob' that literally bores through walls and floors over the weekend and loots whole business buildings of money, furs, jewels, or whatever seems worth-while. Unless it's guarded by watchmen, a business building is safe only if it's been 'bugged,' as the burglars say, which means wired up for a good burglar alarm."

Buffet Burglary

The classic example of "bore-and-smash" operation in recent years was the Portage Park Vault Company job in Chicago. Here a mob of master cracksmen looted 500 safety deposit boxes of jewels, heirlooms, and money galore—much of it believed to be cash belonging to big-time Chicago gamblers—with losses said to run into millions. The burglars came in Saturday afternoon and worked right through the weekend to early Monday morning, refreshing themselves at intervals with milk, soda, beer, and sandwiches. They needed time—they had to burn their way through one large steel door with torches and smash through 18 inches of reinforced concrete.

Snowdon "covered" the Portage Park job, as he does in a few major cases, just to see whether the mob had picked up anything new that his office didn't know about. The Portage Park vault, which had 10-inch steel doors set in its 18-inch reinforced concrete walls, was much heavier than the average bank-vault installation, so he reported that the most modern bank vault is vulnerable to attack and that physical construction should be backed up by proper burglar-alarm equipment. END

Gnawing Is Rat's Life Insurance

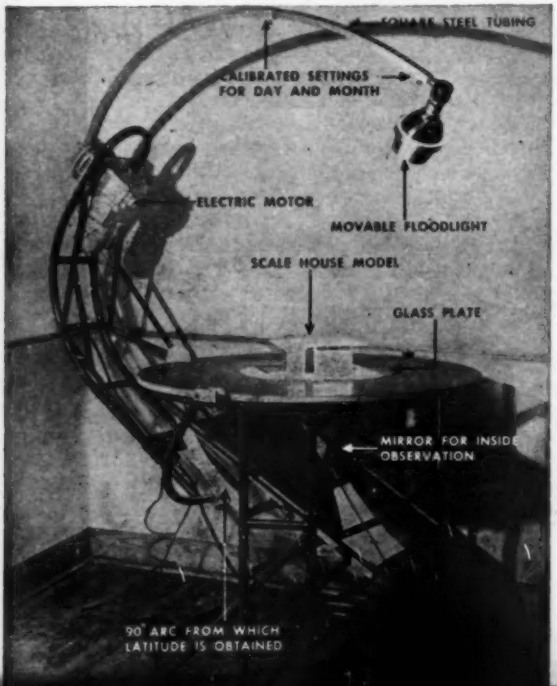
If a rat didn't gnaw constantly, its gnawing mechanism—a set of sharp incisors curving back toward its throat—would grow back into the throat. As a result, the animal would strangle in as little as a year's time.

Barrow Climbs a Hill

THIS may look like an oversized wheelbarrow—but did you ever see a wheelbarrow climb a hill under its own power? This three-wheeled, power-driven dump truck can take a 1,000-pound wet or dry load right up a 20-percent grade. Called the Prime Mover, the 400-lb. machine, made by Bell Aircraft, can turn in its own length. Its three-hp., air-cooled engine runs eight hours on three gallons of fuel. The 10-cubic-foot self-dumping bucket can be enlarged with sideboards to hold up to 18 cubic feet. For larger loads, a platform replaces the bucket. A snowplow can be attached.

Quick Window Washer

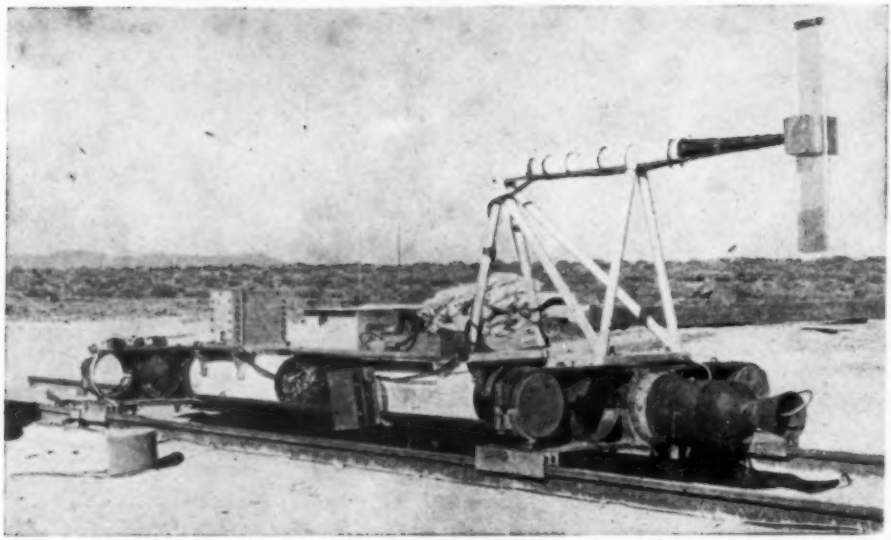
DON'T you wish you could clean the windows in your home as easily and quickly as this mobile window washer can make train windows sparkle and shine? Designed by W. H. Gould, superintendent of the Union Pacific's car department at Pocatello, Idaho, it can clean all the windows of a 12-car streamliner in eight minutes flat. The job is done by a revolving brush mounted on a small power truck. As the truck speeds alongside a waiting train, water is sprayed on the windows and the spinning brush scrubs them clean. Thirty gallons of water are used in a 12-car cleaning operation.



In the Path of the Sun

SOMETHING new under the sun is this novel heliodon that shows the where and when of sunlight as it would affect a building at any time of the day, month, and year —and at any given latitude.

The arc-suspended floodlight shown in the picture at left doubles for the sun. Telescoping tubing from which it is suspended can be adjusted for the time of day and month desired. Latitude is obtained by setting the rod's base along a 90° arc beneath the table. An electric motor swings the floodlight over the house in 30 seconds, duplicating the sun's path from sunrise to sunset. An underneath mirror allows observation of interior sunlight effects through the glass floor. Invented by Prof. George M. Beal, of the University of Kansas, the new heliodon shows architects how to use natural lighting to best advantage, while screening out excessive sunlight.



"Locomotive" poised for a 1,000-m.p.h. desert speed run. Note airfoil mounted for test.

Rocket "Locomotive" Hits 1,000 M.P.H.

USING the 50,000 lb. of thrust developed by five big rockets, experimenters have sent a "locomotive" hurtling 1,019 m.p.h. down 2,000 feet of standard-gauge railroad track.

They had a reason. They wanted to learn if it is possible to reach speeds beyond the 760-m.p.h. of sound at sea level with an earth-bound vehicle that could be controlled. This would give them a new way to test airplane shapes designed to zip through the transonic region.

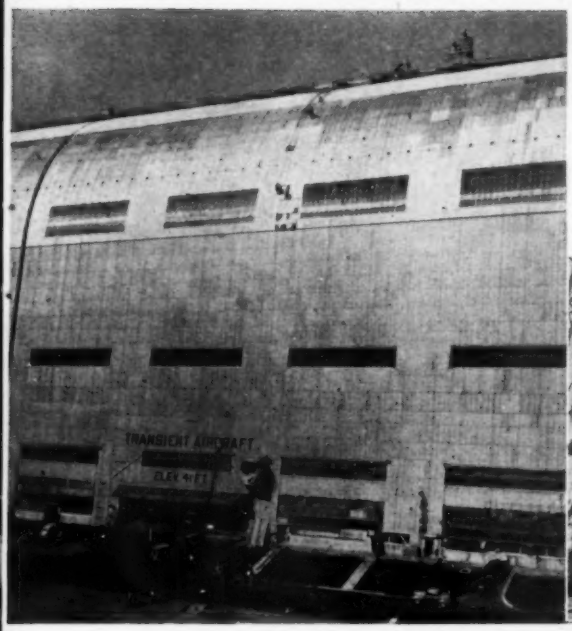
The answer is that it is possible to achieve the speed, but hard to control the vehicle.

Disclosure of the experiment at California's Muroc Air Base was made by Northrop Aircraft, Inc., with the consent of the U. S. Air Force. A model airfoil is suspended on the front end of a needle-nosed rod and sent screaming down the track. It's the reverse of the wind-tunnel system, in which the air is rammed past a stationary model.

The "locomotive" is really a 15-foot, aluminum-alloy sled—a modified jet-bomb launching device. It slides on "slippers" made of magnesium, with stainless-steel inserts for bearing surfaces. Flanges keep it on the track. The thrust of the five massive Monsanto, T10-E1, solid-fuel rockets lasts 1.8 seconds. The track method, incidentally, has already been used to launch supersonic rockets into the air. (PS, Apr. '47, p. 118).

For test runs, small wing and fuselage shapes are mounted on the rod, or boom. Records are made with high-speed movies and electrical devices. Every 50 feet a small switch, tripped by the speeding carriage, transmits an electric timing signal. The trouble comes when the experimenters try to stop the monster. Up to now they haven't been able to. At the end of the track it tumbles across the desert sands. That ruins it. They tried braking it by dropping a spout into a trough toward the end of the run and making it scoop up water, which was deflected upward and out the top of the sled. But it didn't help much.

Northrop hasn't given up trying to perfect the method, however. The company believes that if only the apparatus can make its 1,000-odd-m.p.h. run on a two-mile track—and be stopped safely in that distance—it will tell them much about design performance at supersonic speeds.



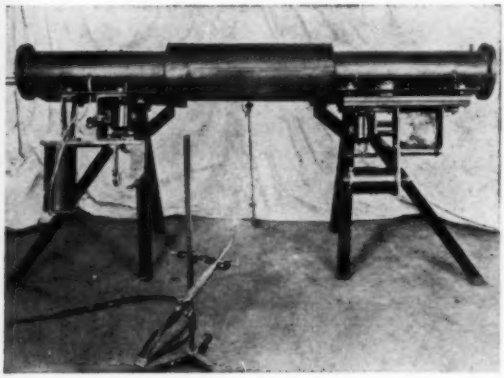
Rooftop Radar Rolls Up

How to set a 5,200-lb. radar unit on top of a 200-foot-high hangar did not stump engineers at the Navy's Moffett Field, Calif. They placed the radar on a bobsledlike dolly fitted with big rollers. Then a line looped over the hangar from a winch on the other side hauled the dolly up the wall.

Twin Light Beams Measure Heat

A beam of light now takes the temperature of rocket flames so hot they would destroy ordinary thermometers. The new light-beam instrument, called an absorption-emission pyrometer, is expected to aid research on rockets and rocket fuels. It makes a continuous record of temperature changes in different parts of the exhaust as the rocket motor starts up on the test stand.

The pyrometer measures flame temperature by the amount of light absorbed and emitted by the flames. Light from a lamp is split into a pair of beams; one beam passes through the flame, and the other does not. An arrangement of mirrors and disk shutters makes the two beams fall alternately on one photoelectric cell. When the brightness of the lamp is varied until the photoelectric cell receives the same amount of light from both beams, the temperature of the flame can be calculated from the lamp brightness. The new pyrometer was developed by Dr. Donald H. Jacobs, of North American Aviation, Inc.



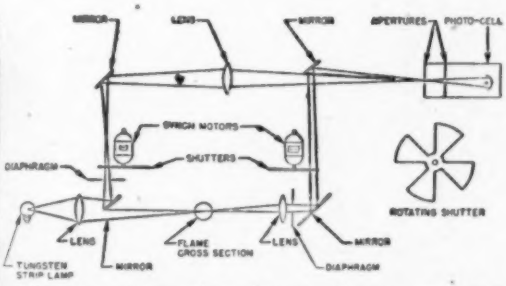
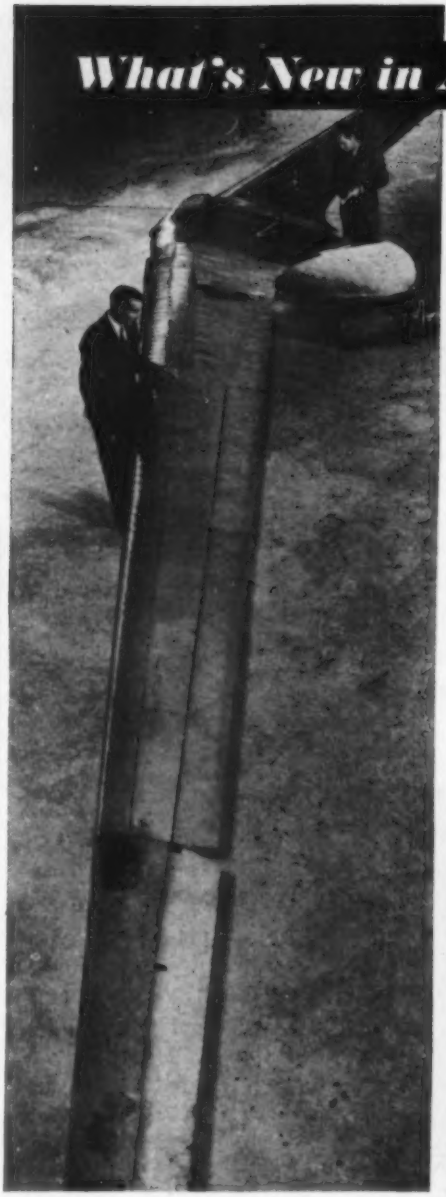
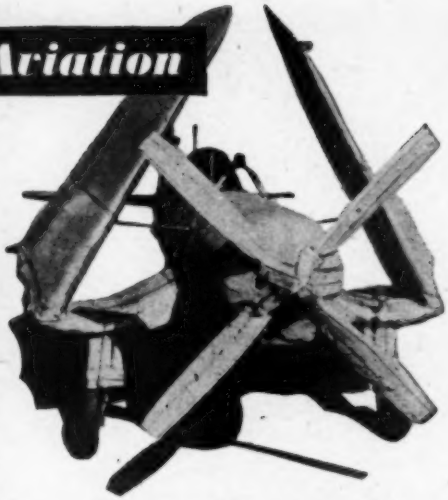


Diagram above gives layout of new pyrometer shown at left. Light from lamp (bottom, left) is split into two beams by lower left mirror, which sends one beam up and around flame as other beam goes through flame. Shutters make beams strike photocell alternately.

What's New in Aviation

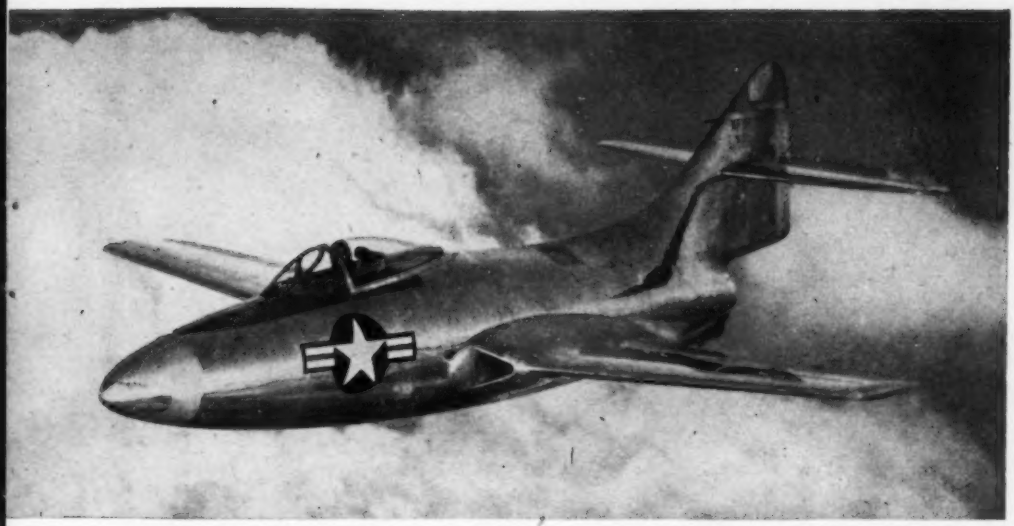




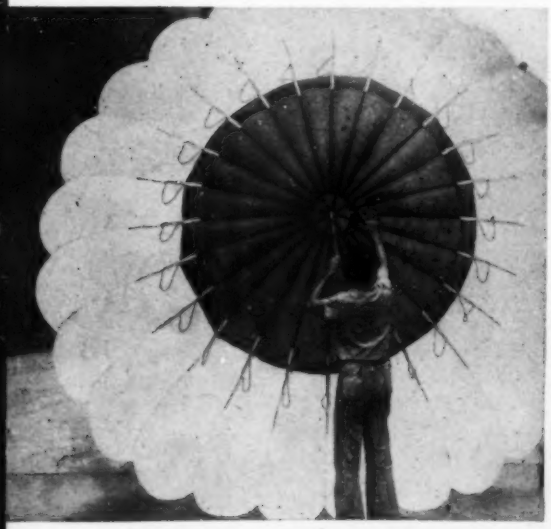
Navy Planes Don Coveralls. Form-fitting zipper bags are the Navy's newest solution to the problem of preserving its planes for short periods. The glass-fiber coverings can be put on in a quarter of the time required for older methods of protection. Drying agents inside the bags protect planes for three months.

Nazi Glider Is All Wing. Captured by the U. S. Army, this Horten Model VI glider has been repaired and reassembled in California at the Northrop Aeronautical Institute for aerodynamic studies. Its elongated wing spans 78 feet, but the cockpit is so small that the pilot has to lie prone to fly the 750-pound craft.

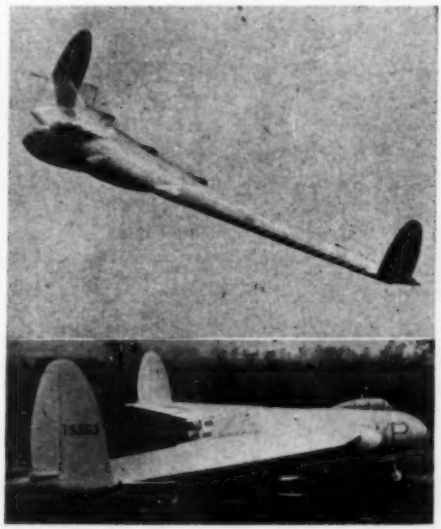
Aerobatic Autopilot. A new Westinghouse automatic pilot weighs only 35 pounds, but is said to be the most sensitive ever developed. Unlike other autopilots, it maintains control even in high-speed loops or rolls. The illustration above shows an engineer holding the control knob of the camera-sized device.



Jet for Carriers. Grumman's XF9F-2 Panther is the latest addition to the U. S. Navy's seagoing air force. Especially designed for short-runway work, the fighter is rated in the 600-m.p.h. class. First model has a Rolls-Royce Nene jet, built by Pratt & Whitney. Later ones will have Allisons, interchangeable with the Nenes.

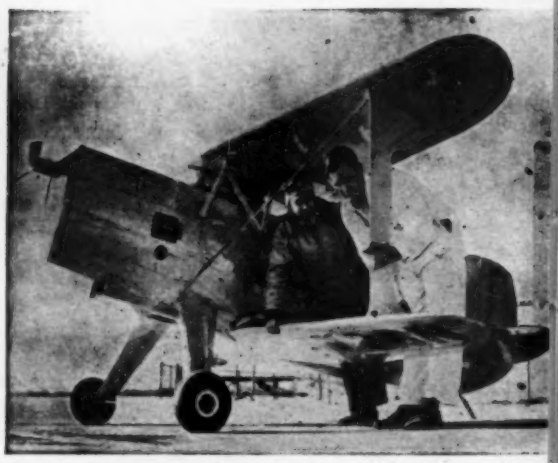


'Chute's Cap Offsets Speed. The center panel of this experimental Navy parachute is held in place by elastic cords. When the 'chute opens at high speed—it has been tested at nearly 500 m.p.h.—the cords stretch and air spills out, lessening the shock. As the 'chute slows down, the elastic pulls the cap back into place.



Tailless Jet Goes Aloft. Britain's Armstrong-Whitworth 52, a twin-jet, experimental craft, has made its first flights. A novel feature of the plane is a "boundary-layer suction" system—a spanwise slot in the ultrasmooth, 90-foot wing. It sucks in air passing over the wing, and helps control the flow and cut drag.

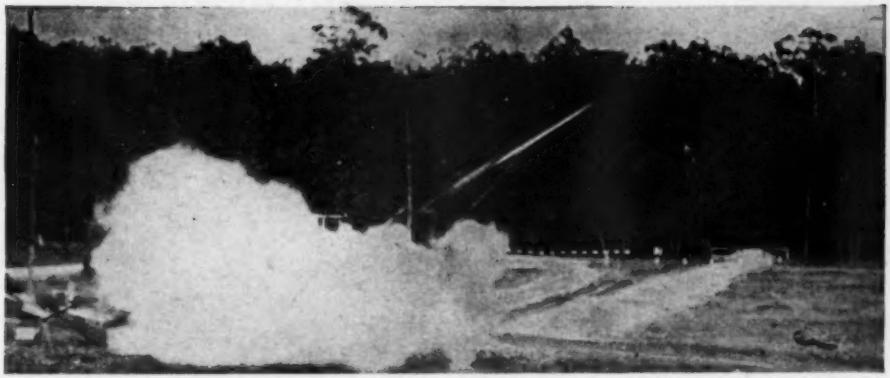
Cutting 'Copter Costs. Economy is a major aim of the JOV-3 two-seater, built by the Helicopter Engineering Research Corp., of Philadelphia. It weighs only 800 pounds empty, and a four-cylinder, 100-hp. engine drives its two 18⅔-foot rotors. Its cruising speed is 73 m.p.h.



Flying Flyweight. The tiny biplane shown above has a wingspan of 15 feet, weighs 500 pounds, and was built in Milwaukee by Edward Effenheim (right) in his spare time at a cost of $500. His companion is Robert Huggins, who took the plywood midget aloft on its first flight.

How to Fly a Connie. Complete even to simulated engine roar, this control panel teaches flight engineers the niceties of operating four-engine Constellations. Instructor sets up flight conditions; student makes his instruments conform.

Jet Maintenance Made Easy. Checking one of the XB-47's six jets in preparation for a test flight, a mechanic demonstrates the accessibility of the big bomber's engines. Their underslung mounting permits the use of an auto-type hood.



This war rocket carried a three-inch rope more than 600 ft. in test as life-saving line-thrower.

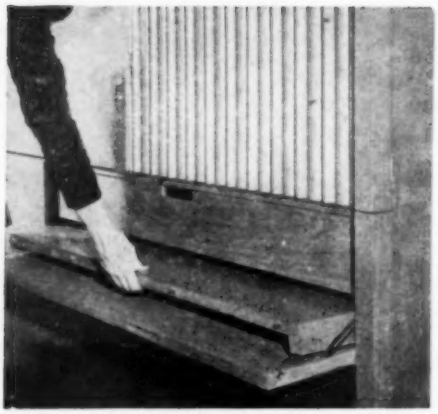
War Rockets for Lifesaving

NAVY rockets designed to kill are now being reconverted to save lives—as line-throwers, carrying rescue ropes either to or from disabled ships. Coast Guard tests show they can snake heavier lines over greater distances than present devices. This may make it possible to make direct connections with lines strong enough to carry a breeches buoy or even tow a vessel. Heat of the rocket is still a problem, however, since it may burn rope or ignite oil-soaked seas.

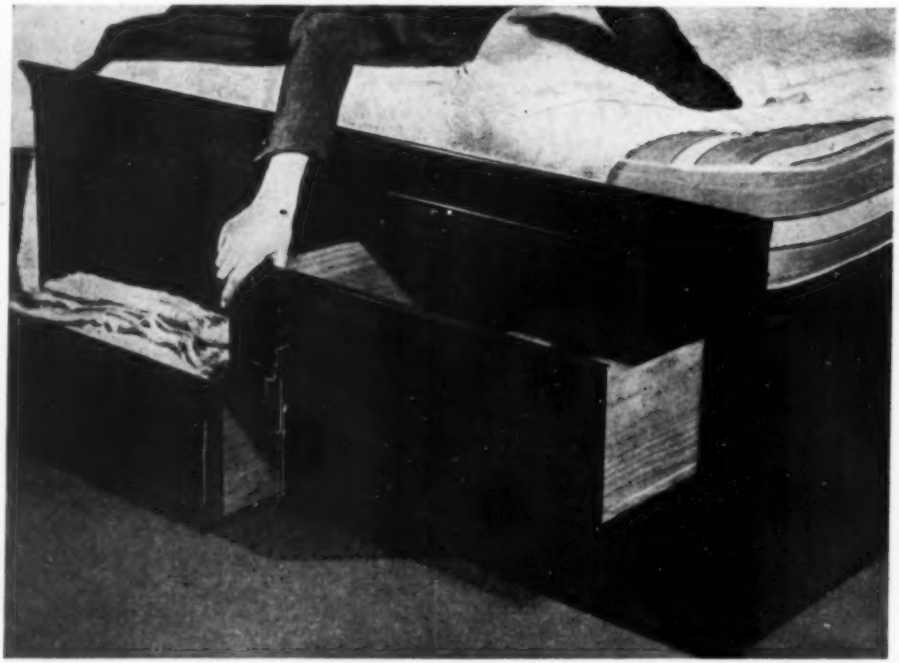
Coast Guard officers prepare to fire rocket with harpoon nose that anchors device in sand.

New Furniture Saves Space

This young lady is preening herself in front of a new dressing table. With the mirror folding out of sight when not in use, it becomes a bureau. Called the "Dress Away," it is made by the Cavalier Corp., of Chattanooga, Tenn.



What to do with table leaves that are not in use? Store them in the cellar or just let them clutter up the dining room? This new buffet solves the problem by providing flat storage space for unused leaves as shown above.

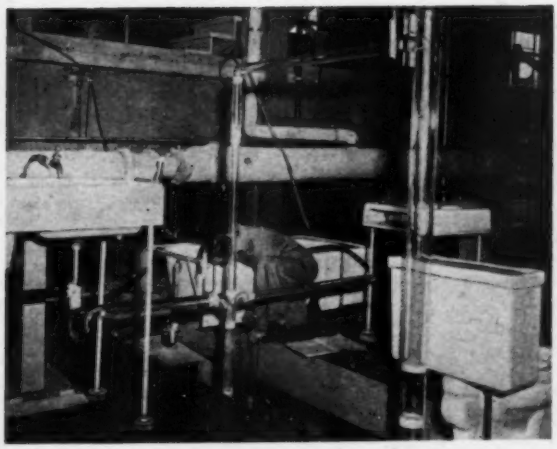


A comfortable bed, this new "Sleeprite" also supplies that much-needed, extra closet space. Drawers at the foot, as shown above, provide ample storage space for bedroom linens. These and many other space-saving, double-duty innovations in functional furniture design were featured recently in a showing of new styles at Chicago's Furniture Mart.

Hot Metal Portraits

HIGH-SPEED electrons and a tiny electric furnace have been teamed in a new camera that snaps pictures of metals as hot as **2,000°.** It was developed by Westinghouse research engineers to study the causes of rust and corrosion in metals and alloys at the extreme temperatures they have to take in jet engines and gas turbines.

Main part of the camera is a five-foot-long hollow cylinder seen in center of the picture at left. Electrons shot out of a gun at the top smash against a sample of metal or alloy, placed inside the lower part of the camera and heated to the desired temperature by the electric furnace seen jutting out at the far left. The electrons then bounce off and strike a photographic film. A viewer enables the engineer, as shown here, to examine the hot-metal portrait in the camera. The pattern traced by the electrons tells how oxidation or corrosion takes place. Studies so far have revealed that corrosion increases very rapidly when metal is subjected to high heat—multiplying as much as 10 times for every 100-degree rise in temperature.



Peeking Inside Pipes

YOUR plumbing is a problem only when something goes wrong. Hydraulic engineers of the National Bureau of Standards, however, take plumbing to heart. They want to know just what happens when a toilet is flushed or a drain plug is pulled. To aid their study of plumbing problems, transparent plastic pipes are used in the full-scale home plumbing system shown above.

Household Hideaway

IF YOU want your valuables close at hand, this floor safe looks like a good bet. Built like a milk can, vanes welded to its sides keep the steel case from turning when buried in a concrete block. When the key is inserted in the safe's lock, as shown above, the center compartment pops up to permit the circular head to be lifted. It is made by Nu-Way Industries, of Chicago, Ill.

David E. Lilienthal, chief of the Atomic Energy Commission, smiles disarmingly across the desk that keeps him at the hub of things. He designed this one while Chairman of TVA.

Atom Boss Designs Own Desk

LITERALLY surrounded by work, David E. Lilienthal, busy Chairman of the Atomic Energy Commission, spends most of his time on the business side of a massive, functional workbench that all but encircles him with efficient-looking pigeonholes and plentiful

Front view of the Lilienthal desk shows its horseshoe shape. Construction is novel in the use of a special, TVA-developed, six-ply laminated wood composed of lumber that was formerly discarded. The top ply is made of first-grade oak. The desk was built by two TVA employees: Mack Bloomer, who did the carpentry, and Walter Cloyd, who did the finishing.

work space. Its peculiar shape, which defies geometric definition, looks something like a horseshoe on the bias.

Stranger still, perhaps, is the origin of the odd design, since it dates back to a time in college when Lilienthal suffered an ankle injury playing football. To make studying easier, he arranged several desks around him in a semicircle, one of which was an old-fashioned secretary with plenty of pigeonholes. It was the use of this desk that established the supremacy of pigeonholes over drawers for storage space.

Years later, a second version of the desk, a makeshift table consisting of eight-foot-long planks laid over trestles, saw him through 13 years as a director of the Tennessee Valley Authority. This model had the pigeonholes, now widened to take papers flat, but was not curved. Lilienthal says he finally tired of reaching for everything and "simply pulled in the ends" around him to make the semicircular shape.

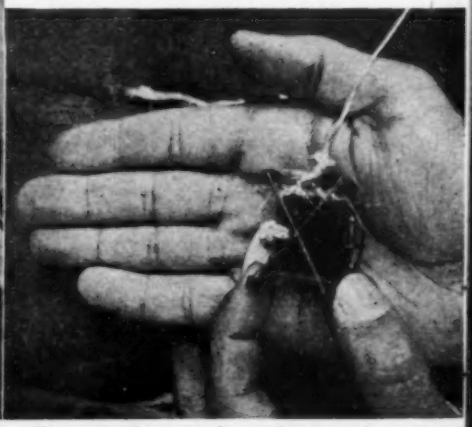
The latest model, shown here, looks a little like a railroad roundhouse and is just as efficient. The right side, slightly longer than the left, creates an attached conference table for the inevitable meetings.

Except for its size and shape, the desk is conspicuous in its simplicity. Its modest appointments include a single phone, a lamp, an unornate desk set, and some family pictures. It has no radio, television screen, or built-in bar. It's made for work.

Pigeonholes seen here keep work from being buried in drawers. Longer right side makes room for papers and meetings, is still within arm's reach. Edge shows how waste wood was used in six-ply construction. Note blotter curved to fit. Wooden chair was substituted for photographic purposes. At work the AEC boss uses a leather swivel chair for easy maneuverability.

Body Can Take Heat

Variations in temperature of air as it is breathed in and out are measured by these thermocouples inserted in nose and mouth. These special thermometers reveal that the body acts as a refrigerator, remaining as much as 100° cooler than the temperature in the hotbox.



Getting ready for the hotbox treatment, this UCLA engineering-student volunteer is dressed in a harness to which nine thermocouples are attached. These sensitive instruments register external skin and body temperatures on the forehead, right chest, left back, abdomen, left upper arm, right forearm, right calf, and left foot. While the subject is sweating it out, frequent readings are taken and instantly recorded on a moving tape for later study.

Shown in close-up above, thermocouples consist of crossed iron and constantan (an alloy of nickel and copper) wires. They are held against the skin by a plastic bridge. In addition, the "victim" from time to time presses a tiny auxiliary thermocouple to one eyeball.

that Boils Water

Wearing jacket, trousers, and canvas overshoes, the guinea pig, seated in a tracked chair, is shoved into the oven. The thermometer rises to 220°. Water would boil, and eggs cook, but he takes it without too much discomfort. At the end of 15 minutes, he's gasping for breath, sweating profusely, and in a fighting mood—but otherwise in comparatively good shape.

SWEATING it out in a metal box at more than 250° F., University of California at Los Angeles experimenters have proved that the human body can take temperatures that would cook meat and boil coffee—but only for a short time. The tests are being conducted for the U. S. Air Force to find out how pilots would react should the cooling apparatus fail in the supersonic planes of tomorrow (see Cooling "Hot" Pilots, p. 110).

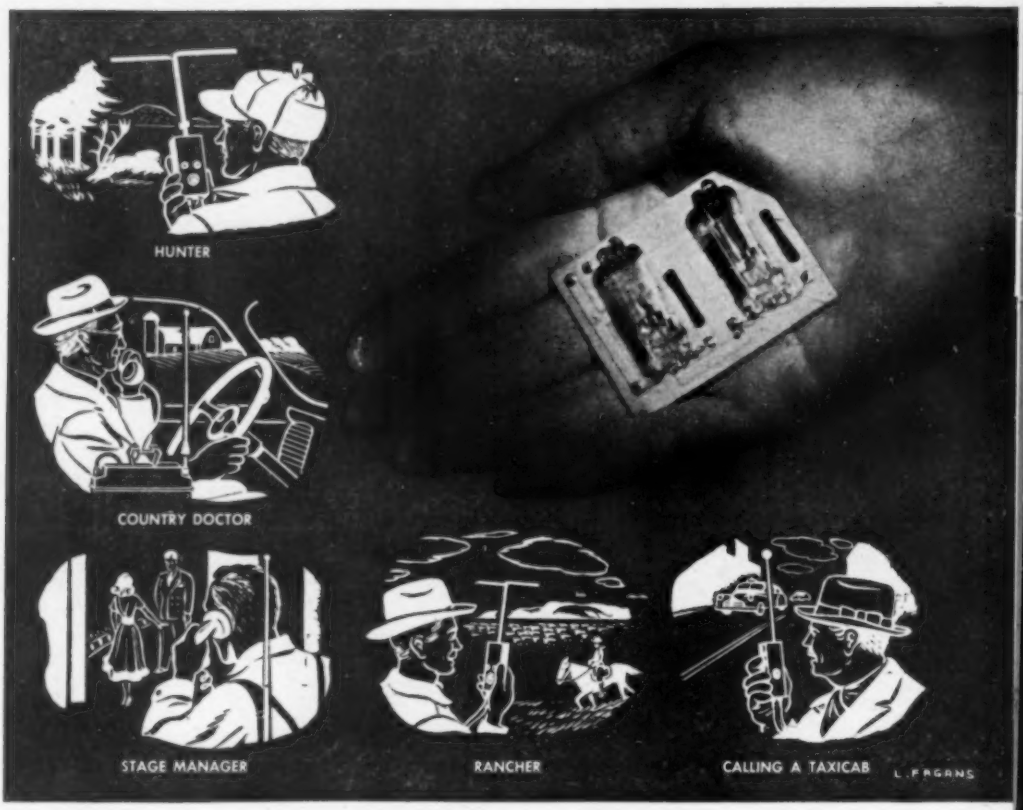
The reason the body can withstand temperatures previously regarded as fatal is that it acts as its own refrigerator. Evaporation of moisture through the skin forms a boundary layer of cool air in which the body wraps itself. Subjected to temperatures of 200° F. and more the skin heats only to about 105°, while the body hovers around a safe and fairly comfortable 100°.

The sweatbox used in the experiments is a metal-sheathed cylinder, five feet in diameter, that served to test aircraft instruments during the war. Electric strip heaters, thermostatically controlled, produce any desired heat. Already several volunteers have taken 220° F. for 15 minutes and more. Dr. Craig Taylor, in charge of the project, has "cooked" at 262° for two minutes, and is warming up for a 300° session.

How Wrinkleproof Is Your Suit?

You get the answer on the first muggy day you wear that natty, new, double-breasted job. But perhaps you'd like to know before you buy. That's what this wrinkle meter, developed by Monsanto Chemical Co., is for. Ordinary methods of testing the "bounce" of fabrics do not allow for changes in temperature and humidity, gravitational effects, and human error. The new wrinkle tester, it is claimed, permits accurate measurement under all conditions.

For testing, such materials as woolens, worsteds, cottons, or rayons are creased and mussed. One end is then inserted in a jaw of the meter, the other end hanging free. The degree to which the free end "bounces back" is then read on an "angle of recovery" scale graded from 0 to 180°. A reading of 100° is considered to be a reasonable guarantee against baggy pants.



Coming—the Radio that Was Shot from a Gun

The tiny elements used in a great war invention are now ready to go to work in civilian transceivers.

By Harland Manchester

CARRYING a complete broadcasting station in the palm of his hand, a radio engineer walked out of his laboratory at the Bureau of Standards in Washington the other day, talking as he went down the stairs and out of the building. His voice came to us from a loudspeaker in the room he had left, as clearly as if he were still there. His transmitter, containing microphone, tubes, circuits, batteries, and aerial, was enclosed in a plastic box about the size of a pack of cigarettes.

This is one of many types of subminiature radios, developed at the Bureau of Standards and elsewhere as a result of wartime research, which a dozen manufacturers will soon offer to the public. There are receiving sets the size of a fat wallet, which pick up

standard radio programs, and two-way radio sets to be carried by a shoulder strap like a camera. In the Bureau's laboratories there are short-range broadcasting stations the size of a lipstick, with certain tubes little larger than a grain of rice, and other transmitters about as large as a thick powder compact, which can be worn on the wrist, with midget batteries concealed in the strap.

These amazing little radios were sired by one of the most devastating new weapons of World War II—the proximity fuse. This is a radarlike device, mounted in the nose of an artillery shell, which detected the presence of enemy planes and caused the shell to explode if there was a plane within a radius of 70 feet. Before its use, anti-aircraft fire was notoriously ineffective. In the Battle of Britain, it took 2,500 shells, with good marksmanship, to bring down one German plane. British and American scientists conceived the seemingly impossible notion of sweating down a radio sending and receiving station into a space the size of an ice-cream cone, so that it would fit into the nose of a shell. This ambitious project was carried out by the Office of Scientific Research and Development, with Dr. Merle A. Tuve heading a group that included many of the country's leading physicists and corporation representatives.

Tubes Tiny but Tough

Sturdy little radio tubes smaller than a half-smoked cigarette were already being made for hearing aids. These were made still smaller, and so strong that they could be fired from guns at a force 20,000 times that of gravity without breaking the glass walls or the fine filaments. Before V-J Day, 130,000,000 of these tubes had been made by Sylvania Electric Products, Inc., and other firms, and the cost had approached that of many standard tubes.

Rugged miniature batteries of new design were also developed, and the parts were cleverly assembled in the incredibly small space. The result was one of the greatest advances in modern warfare. For the first time in the history of fighting planes, anti-aircraft fire became effective. German V-1s and Japanese Kamikazes triggered the shells as they came within range of the tiny radios and were blown to bits. Entire German battalions were wiped out in the Battle of the Bulge as proximity-fused shells exploded at a lethal distance above ground, making shelter futile.

A further development, which came late in the war, was the printed circuit. Look in the back of your radio and you will see a baffling maze of wires strung in place laboriously by hand. This has long been one of the bottlenecks of radio manufacture. So, using an idea that had been hanging around for years, engineers of the U. S. Bureau of Standards and Globe Union, Inc., of Milwaukee, learned how to print, stamp, or stencil the wiring on thin plastic or ceramic sheets. Little lines made of thick silver ink carried the current through its paths, and an ink containing powdered carbon was used for resistance circuits.

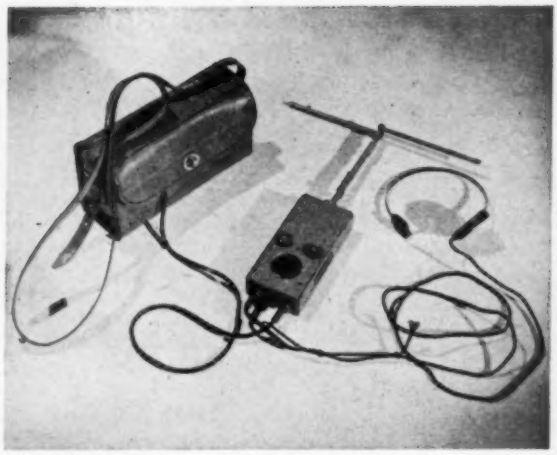
This process has been perfected to the point where the circuits of a miniature radio set can be printed on a bit of plastic the size of a calling card. These circuits perform as well as wired circuits, and are less likely to get out of order. As an ultimate refinement of miniaturization, the wiring has actually been etched on the little glass tube itself.

It cost America $800,000,000 to develop

STEPS TOWARD POCKET BROADCASTING

Fuse fathered tiny tube and printed circuit; Handie-Talkie ® presages pocket transceiver.

This Earadio Ⓣ weighs 8¼ oz., measures 3⅝ by 4 3/10 by 1¼ inches. Retractable antenna is on top, earplug is metal disk at bottom. It is made by Masterpiece Radios, Inc.



Ultraphone Citizens Radio Ⓣ is transceiver designed for FCC's forthcoming Citizens Radio Service. Six inches high, it weighs 2¼ lb. with batteries. Folding dipole antenna plugs into top.

and produce this epochal weapon. Since the war, Dr. Cledo Brunetti and half a dozen co-workers of the Bureau of Standards have spent their spare time converting the radios that were shot from guns into sets for civilian use, and a large section of the industry is tooling up to build them. Soon we are to get returns on our investment, in the form of pocket radios with a thousand and one uses. And in a few years the midget tube and the printed circuits, built into everyman's radio, should cut its size, weight, and cost, and make repair jobs easier.

Ear Aid First to Use New Printed Circuit

The first printed-circuit device to reach the market is a six-ounce hearing aid little larger than a cigarette pack. The makers, Allen-Howe Electronics Corp., of Peabody, Mass., achieved this result by boiling down the 173 items of the old amplifying system, including wires, screws, soldered joints, and tube sockets, so that it could be mounted on a printed ceramic wafer about half as big as a graham cracker.

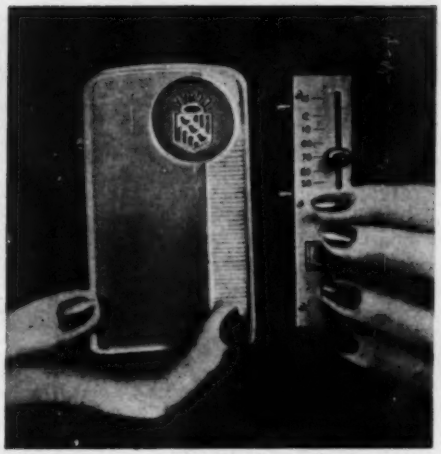
Using the tiny tubes, printed circuits, or both, three firms, Raytheon, Masterpiece Radios, and Modernair, will soon bring out pocket radios that will pick up standard broadcasts. As highly styled as cigarette or vanity cases, they measure about three by five inches, and an inch or less thick, and weigh as little as nine ounces complete. These personal portables have earplugs attached to thin wires, and are no more conspicuous in use than hearing aids. They have the usual knobs for tuning and volume control. Estimated prices range from $20 to $65. They will probably become popular as de luxe gifts for travelers.

Many firms are rushing light, portable transceivers, as two-way radios are called, for the new Citizens Radio Service, an exciting field of communications that should be ready for the public soon. Three years ago the Federal Communications Commission, spurred by the zeal of Commissioner E. K. Jett, set aside the new radio band for any citizen, firm, or organization to use in transmitting business or personal messages. Over this band the doctor can talk with his office, the reporter with his city editor, the husband with his wife, or the hunter can ask the boys at the camp to come and help him bring in a deer.

Among the few restrictions: paid messages cannot be sent, programs cannot be broadcast, and licenses to use sets will not be issued to aliens. All users will be licensed at no cost. Since the band (460-470 megacycles) is in the ultra-short-wave part of the radio spectrum, transmission is roughly limited to line-of-sight. This means that while a fire watcher on a mountaintop or a passenger in a plane might talk with someone 100 miles away, surface communication would be limited to about five miles.

Several hundred two-way portables are

The Solo-Pak Ⓣ is one of the tiniest single-unit hearing aids yet devised. It uses new printed circuit, smaller than a playing card and only 3/32 inch thick, claims greater efficiency.



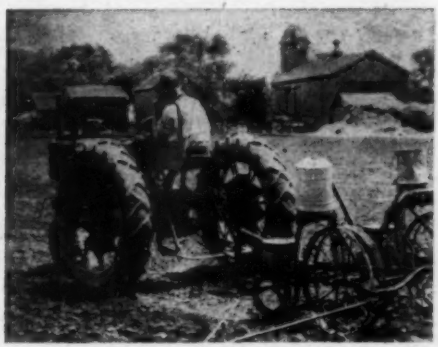
The Acousticon Radion Ⓣ combines a tiny hearing device with an even tinier radio, shown at right. Radio simply plugs into the side of the aid, imposes no extra battery strain.

now being tested experimentally by police, firemen, geologists, and motion picture producers. Because of the narrow band allotted, not more than 50 conversations can take place at once in any one area. But if users wait for the other fellow to finish, as they do on a party line, everyone in a town of 1,500 who wants a set should have ample time on the air.

Scores of practical jobs are being proposed for the new service. The Gross Electronics Corporation, of Cleveland, is making a two-and-a-quarter-pound set to be carried by shoulder strap like a small camera, and reports that a newspaper has ordered sets for reporters. A steel firm wants it for interplant communication by peripatetic foremen, inspectors at a railway food terminal wish to try it out for making reports on the condition of carloads of produce, and the ground keeper of a big cemetery wants a set for reporting the condition of graves.

The military type of "walkie-talkie" was once used by a group of hunters in closing in on a bear; citizens' sets can be used in the same way. They should be of particular value to guards and watchmen, foresters, ranchers, and lumbermen. Their use is foreseen in co-ordinating activities of yacht fleets, motor caravans, parades, and county fairs,

The tiny ceramic wafer at right is the printed circuit developed by Allen-Howe Electronics Corp. for their Solo-Pak Ⓣ aid. It replaces the 173 items jumbled together in the foreground.



The Handie-Talkie Ⓣ, developed by Motorola, enables a farmer to radiophone right from his tractor. An FM transmitter-receiver, the 8½-lb. unit is designed for the 25-44-mc. band.

and for emergency communication systems when storms and floods knock out phone service. Owners of small private planes will probably use them for ground communication, and, of course, a lot of people, like the boys on the amateur band, will use them just for fun.

A good example of the value of short-range radio can now be seen at Lake Success, where proceedings are speeded up 50 percent by light portables passed out to delegates. Speeches are translated and broadcast simultaneously in English, French, Russian, Spanish, and Chinese. Delegates tune in on their own wave lengths, and can leave the room without missing anything. It would be technically possible to set up telephone relay stations so that people at public gatherings or on beaches could make calls via pocket radio.

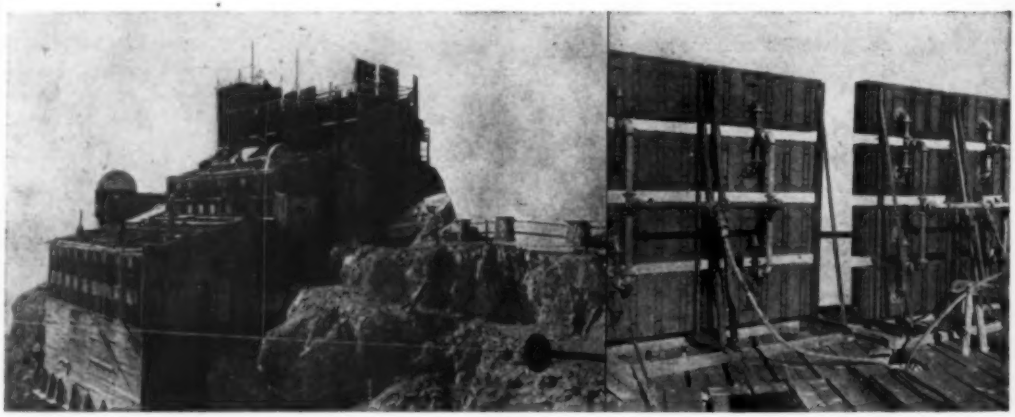
Smaller Tubes Mean Lighter Planes

Tiny radios are only one result of the great wartime project. General Electric engineers predict that in a few years a large transport plane will carry more than 600 electronic tubes, which at present weigh 225 pounds, while the same number of miniature tubes tip the scales at 37 pounds. Space is also saved, and the tubes are so sturdy that you can safely bounce them on the floor.

The new tubes, together with the printed circuits, seem destined to usher in a revolution in radio sets and other electronic devices. By printing or stenciling the wiring circuit on a plate, one workman can turn out about 500 circuits in the time it now takes him to wire one set. There are about a hundred soldering operations in the average household radio set; printed circuits may eliminate half of these jobs, with important savings in labor and materials.

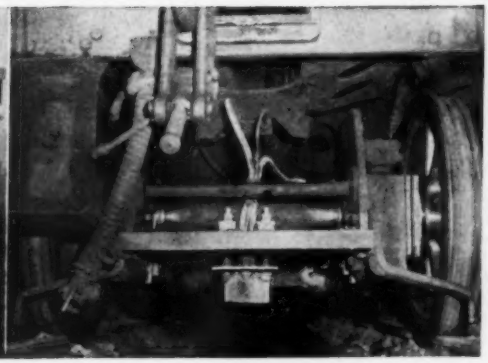
A plastic block on Dr. Brunetti's desk, resembling a paperweight, gives a further glimpse of the radio of tomorrow. This is the new "potted" radio developed at the Bureau of Standards. Circuits and tubes are embedded in a special plastic like flies in amber, to protect them from shock, moisture, and mildew. Plug the protruding wires into loudspeaker, tuner, and light socket and you have a working radio.

It may be some time before all these developments are adopted by the radio industry, but all signs point to smaller, cheaper, more durable sets composed of a few simple parts that anyone can plug together. Today you can buy a radio for $30 that will outperform the $200 set you bought in 1927. This was brought about largely by simplified manufacturing processes. Now engineers see an even greater transformation on the horizon. END



Aerie Houses Relay

THAT'S not a medieval castle perched up on a mountain peak, above left. It's a wireless-telephone relay station on the top of the 9,738-foot Zugspitze, highest mountain of the Bavarian Alps, near Garmisch, Germany. One of three between Munich and Frankfort, the station has been released for German use and is manned by five German technicians. Above, at right, is a close-up of the rear of the station's antenna.



Horn Honks Warning

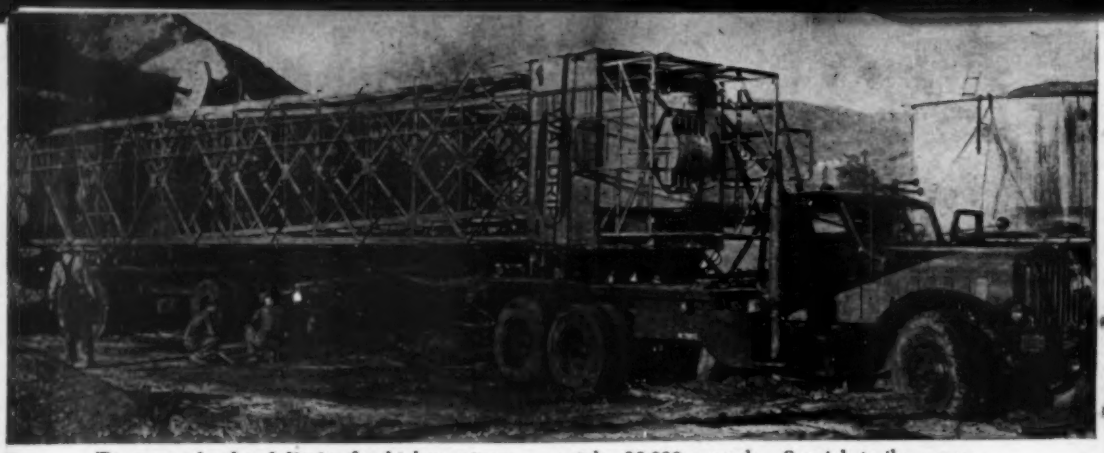
ENGLAND'S pea-soup fogs often blanket railroad signal lights. Now a British engineer can "hear" the signals by means of a horn that blows in the locomotive cab *before* he reaches a signal. Inductors (seen in center of track, left, above) activate a magnetic mechanism (seen suspended below center of locomotive truck, right, above) that blows the horn. If the track is clear, the horn shuts off after 1½ seconds. If it continues to blow its warning, and the engineer doesn't turn it off and apply manual brakes, automatic braking mechanism goes into action, stopping the train within a safe distance.

From Egg to Chirp

EVER watch the birth of a baby chick? Well, here's a novel device that lets you see all at a minimum of inconvenience to both you and the chicks. Swamped with requests to witness the hatching of chicks, the Ketay Hatchery, of Huntington, N. Y., came up with this transparent incubator. Four trays under a plastic dome permit a number of people at the same time to see the entire process, from the first peck of beak through the shell to the fluffy one-day-old chick. Every day a new tray of 19-day-old eggs is added, and a tray of fully hatched chicks is removed. Thus all stages of birth are always on display to interested spectators.

Diesel Is Lightweight

EVEN at high speed (1,800 r.p.m.), there is little vibration in this new 37-inch-long Diesel engine that weighs only 607 lb., yet develops 15 hp. A decompression chamber eases hand cranking and standard gear housings allow a selection of starting power. Its builder, the Standard Machine Works, of Pasadena, Calif., claims that an early model has powered a 30-foot fishing boat for five years at a cost of five cents an hour.



To meet the legal limits for highway transportation, the huge derrick with blocks is packed into a trailer-borne package eight feet square and 63 feet long. It weighs approximately 36,000 pounds. Special trailers were made by the Fruehauf Trailer Co. Mobile derrick can be erected and set to work within a few hours after reaching its destination.

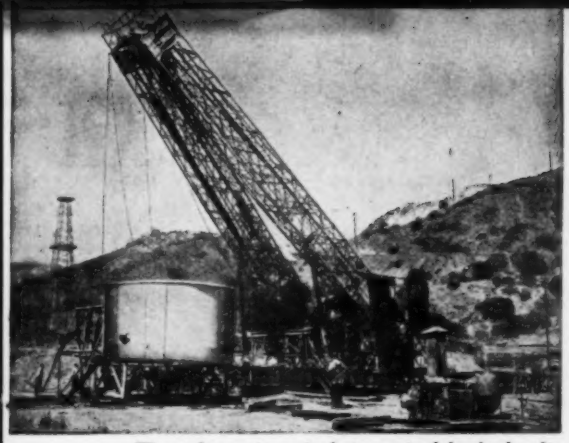
All accessory equipment is equally mobile. Here draw works, complete with walkways, stairs, and raised catheads, all mounted on a turntable, are transported on a three-axle trailer.

This 12-cylinder engine drives the generator. It operates on natural gas, gasoline, or butane. To move the unit, a semi-truck backs under the forward platform and drives away.

New Derrick Has Long Stretch

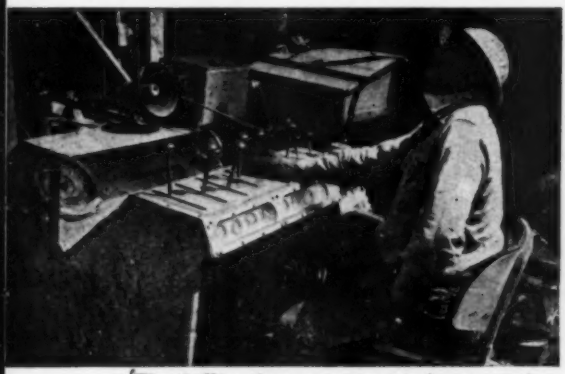
IN OPERATION the twin masts of this new oil derrick rise to the height of a 12-story building. Yet the 18-ton, 123-foot steel structure can be telescoped and moved from well to well in a 63-foot long-trailer-size package. Shell Oil Co. engineers, who developed the new rig, estimate that its mobile feature will save an average of $5,000 in the cost of drilling a single oil well.

Electrically operated, the rig has a 300,000-pound hook-load capacity. After the two parts of the derrick are elevated by hydraulic rams, the structure is stretched to its full height by two electric motors driving four sprockets through worm reduction gears. These motors are mounted in the base of the upper section of the derrick. Rotation of the sprockets makes the upper section climb four chains mounted in the lower section. In case of mechanical failure during erection, safety latches built into the bottom section catch and hold the top section. The rig can begin drilling a few hours after arrival at a new location.

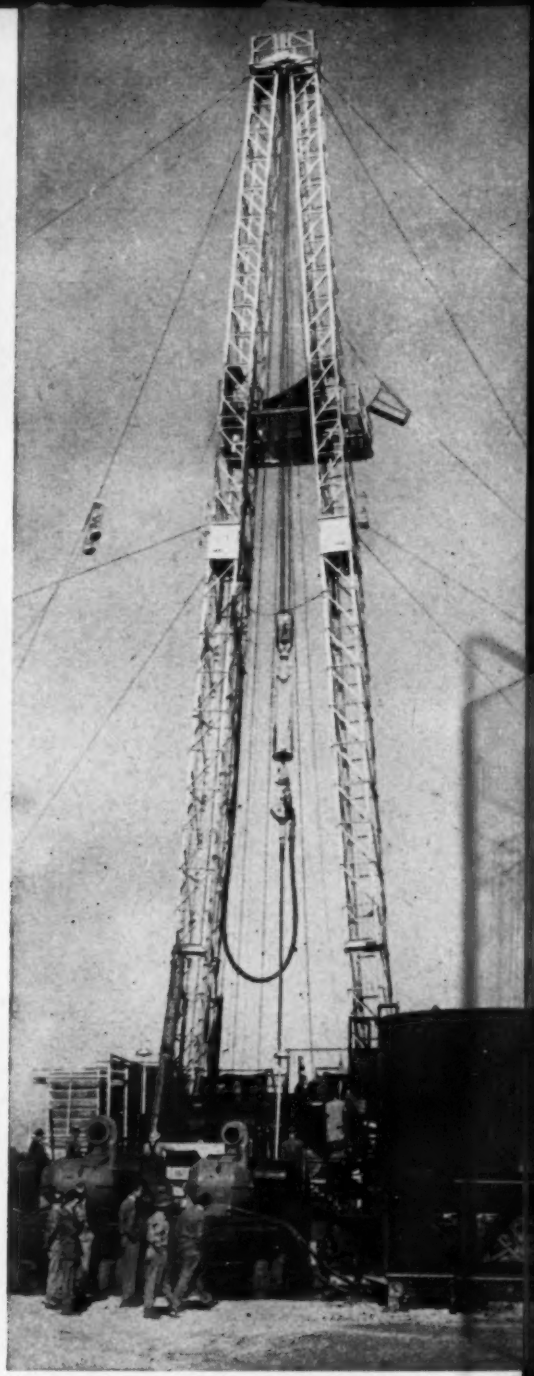


The telescoping rig being raised by hydraulic rams at a drilling location in Shell's mountainous Ventura, Calif., oil fields. Electric motors stretch the rig up to its full height.

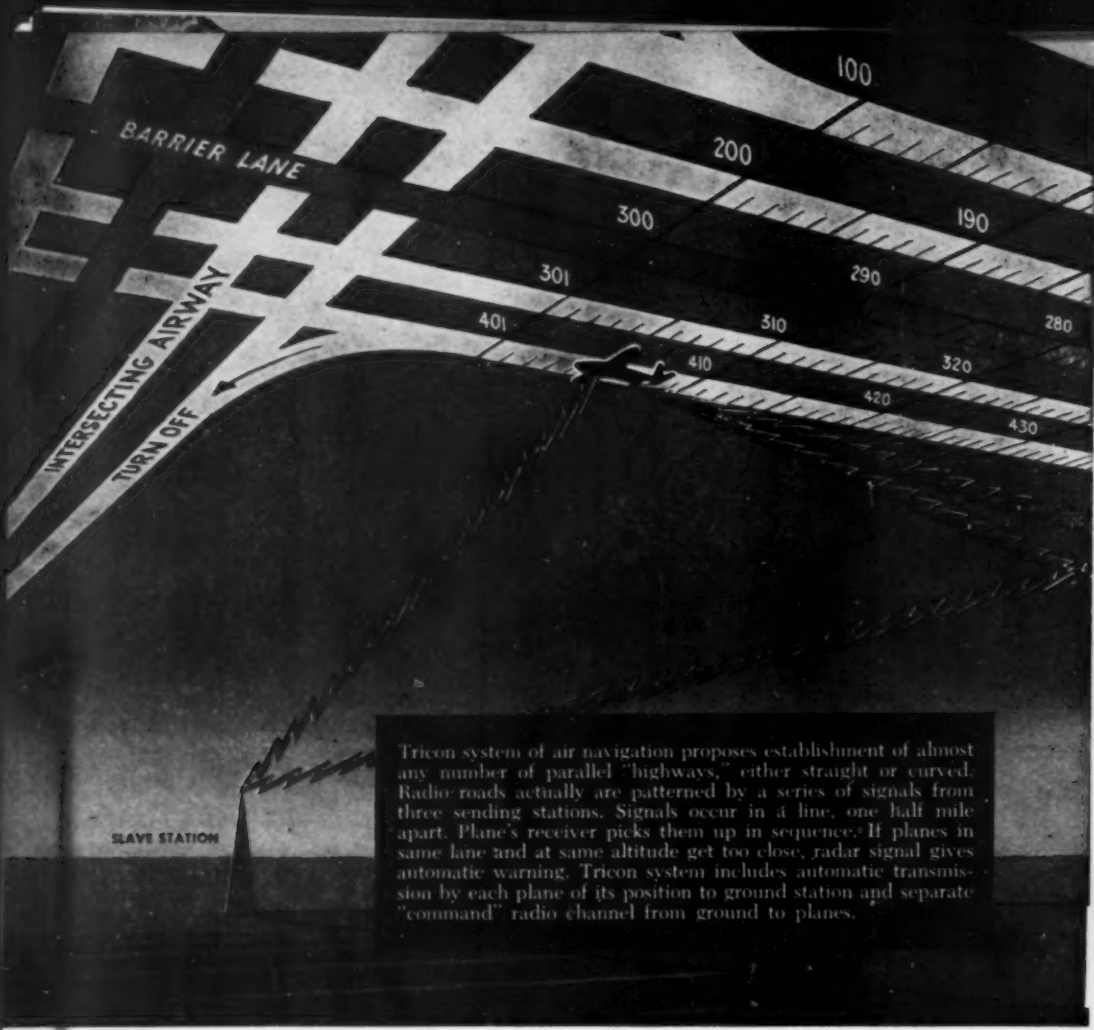
Complete mobility of the entire outfit is demonstrated by these pumps, permanently mounted on trailers that are a part of the pump frames. Eight 10.00 x 15 tires carry the load.



The drilling foreman operates the power plant and keeps the drill working from this central control panel. He is assisted by an elaborate array of electrical devices. A loudspeaker conveys verbal orders. This unit is permanently mounted on a semitrailer.



Towering 12 stories, the twin-masted derrick can drill a hole two miles deep. For night drilling, the working area is illuminated by sixteen 500-watt floodlights seen suspended from the derrick guy lines. The result of two years' research, the unit cost $250,000.



Tricon system of air navigation proposes establishment of almost any number of parallel "highways," either straight or curved. Radio roads actually are patterned by a series of signals from three sending stations. Signals occur in a line, one half mile apart. Plane's receiver picks them up in sequence. If planes in same lane and at same altitude get too close, radar signal gives automatic warning. Tricon system includes automatic transmission by each plane of its position to ground station and separate "command" radio channel from ground to planes.

Radio Builds Railroads In the Sky

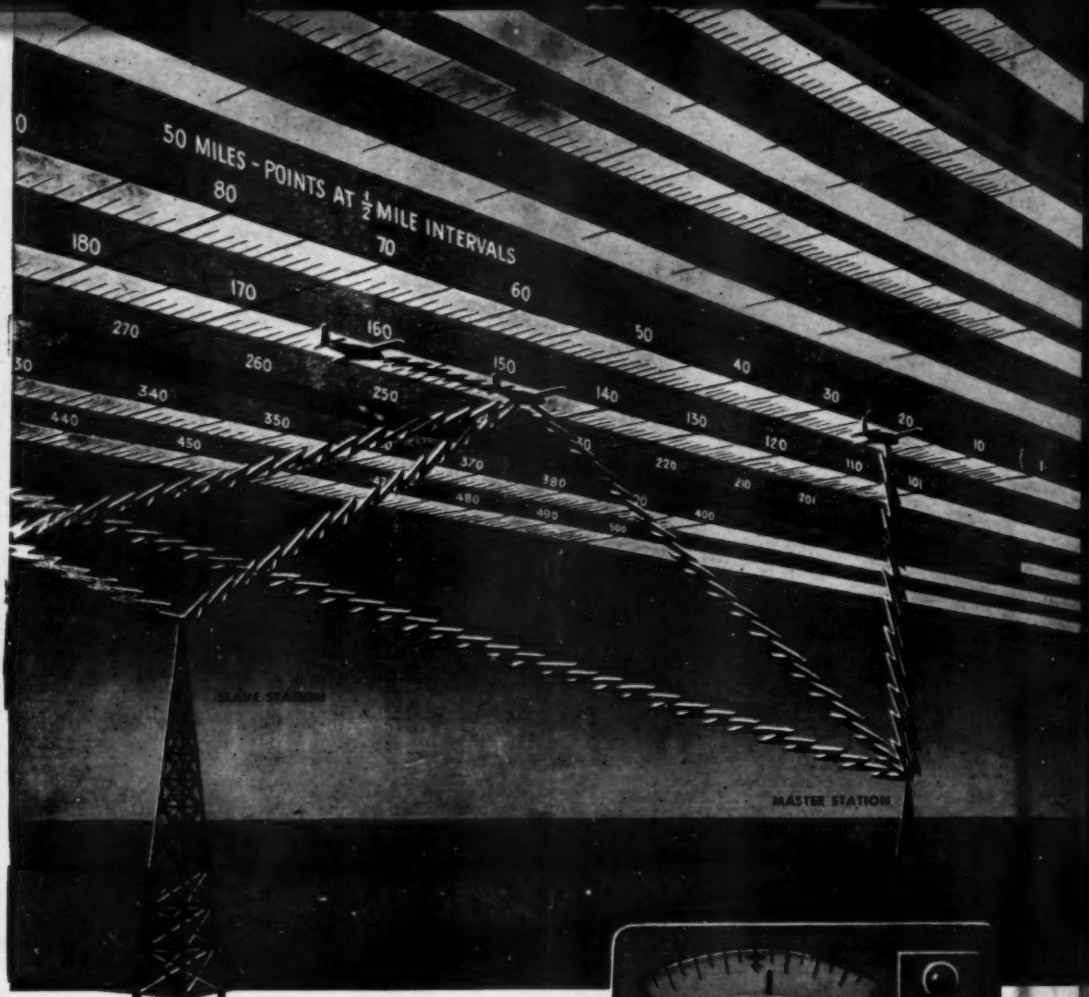
By Devon Francis

BORROWING a barrelful of war-refined knowledge about radio and radar, U. S. scientists have come up with a brace of systems for making transport flying as safe and systematic as railroad operation.

One system is called TRICON (for *TRI*ple *CO*incidence *N*avigation). The other is known as the B-D Computer Aerial Navigation System.

Both are designed to take the nightmare out of navigating an airplane from one city to another when the weather closes down and even the birds start walking. The B-D Computer system also has another feature: it can be adapted for actually landing an airplane automatically with the aid of the federal government's experimental Instrument Landing System (PS, March '46, p. 74).

The present inter-city navigation system,

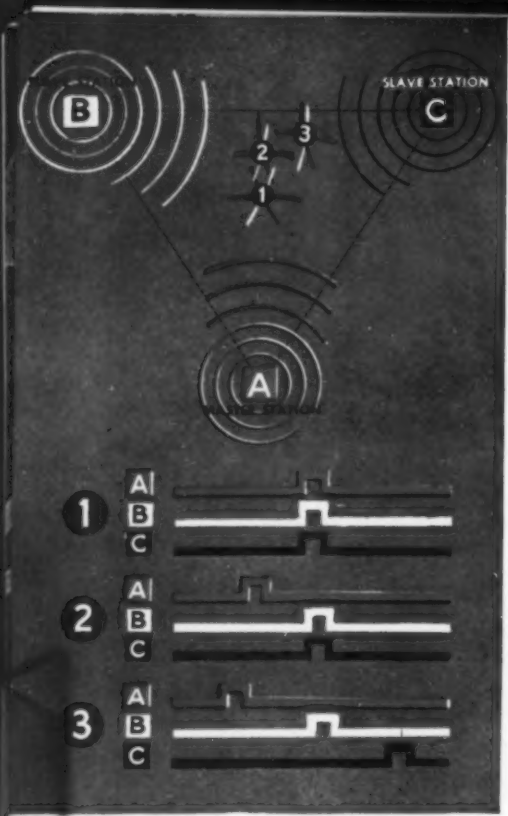


in use for a score of years, has worked pretty well up to now. But the trouble with radio beams, or ranges as they are called, is that in thick weather airplane schedules have to be slowed for safety's sake. A beam provides only two lanes for traffic on any given airway.

The General Electric Co., for which Tricon was evolved, and the Minneapolis-Honeywell Regulator Co., which developed the B-D Computer system, say this is nonsense, and they present some answers.

Under either system, in the air space where only one airplane now flies in soupy weather hundreds could fly in complete safety. Let's look at Tricon first. Ever lose a favorite fishing rod over the side of the boat? After you got control of your temper, you took a line of sight on a tree on shore,

Proposed cockpit instrument panel gives pilot course deviation, airway number, lane identification, plane's altitude, mileage flown. Buttons and lights let him examine occupancy of lanes above, below, and on each side. Vertical lights at right are for commands from the ground.



Heart of Tricon is pattern of signals from three stations. In pattern 1, all stations pulse together, placing point of triple coincident reception equidistant from transmitters. In patterns 2 and 3, pulses lag, displacing points of simultaneous reception.

and then on another one some distance from it, and calculated the angle between them.

You did this so you could locate the spot where the rod had disappeared when you returned with a grapple. You oriented yourself. You "triangulated." Tricon proposes to create a whole scad of superhighways for transport planes on every airway in the United States with wholly automatic triangulation by radio.

Navigation by triangulation is nothing new. Transoceanic planes have used it for years. War's Loran system (PS, Feb. '46, p. 78) was, in essence, a means of locating an ocean vessel or plane by measuring angles and computing distances. What makes Tricon interesting is the way its originator, Dr. Luis W. Alvarez, of the University of California, proposes to do his triangulating.

As in Loran, he would use a "master" and a couple of "slave" radio sending stations. Each leg of the triangle separating them would be many miles long. They would "scan" a total distance of about 50 miles.

Families of these stations would be built at intervals along each heavily traveled airway. For every half mile of travel, a pilot would be advised by an indicator on his instrument panel whether he was where he was supposed to be. And this is the way Dr. Alvarez says it would work:

Radio pulses travel at a fixed speed. That's about 1,000 feet each millionth of a second. Now, supposing the "master" sending station and the co-ordinated "slaves" emit signals at the same split second. Any receiving set equidistant from all three stations would experience a simultaneous reception—the signals would come in by *TRI*ple *CO*incidence.

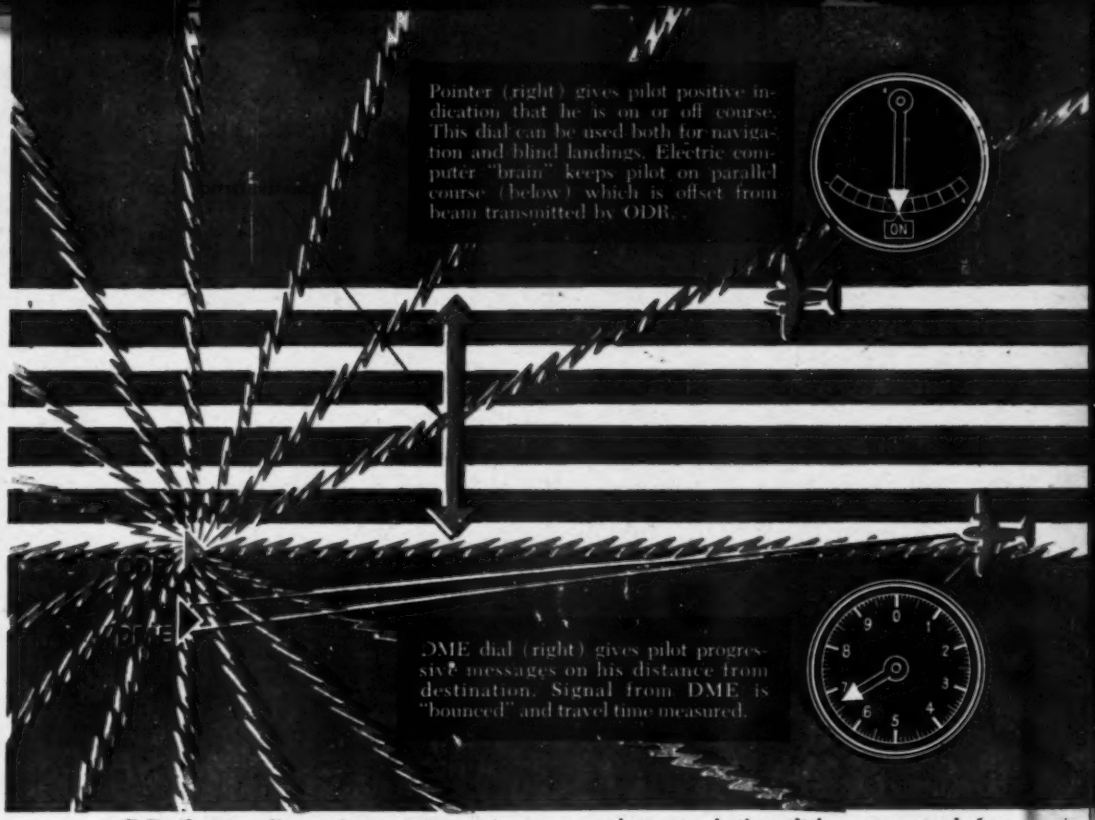
Secret Is in Timing of Signals

But if timing of the signals was slightly off—if the slaves lagged behind the master, for instance, by a millionth of a second—the point where their reception coincided would be 1,000 feet away. The master's signal would have traveled 1,000 feet while the slaves were making up their minds to send.

That's how Tricon sets up superhighways in the sky. By giving the sending stations a progressive change of pace, 500 times each second, 500 successive points at which their signals are received in triple coincidence are established. By juggling the order in which the three stations pulse in each one of those 500 separate cycles, just that many triply coincident signal locations can be spotted along a given airway. At none of them is the sending sequence of the three stations exactly the same.

So far, so good. Why 500 different sending combinations? Dr. Alvarez says the figure is arbitrary. Each traffic highway would need 100 triply coincident signal locations—one for each half mile of the 50-mile stretch being scanned. If there were two outgoing and two incoming highways, that would mean 400 locations. That extra hundred is a "barrier lane" separating opposing traffic, like the white line on the motorist's highway.

That's only the start of Tricon. Now for the gimmick: the system has separate command and control channels. In addition, each airplane using a Tricon airway would be equipped with an automatic "annunciator" radio transmitter. After all, the folks at selected intermediate stations on the ground want to keep track of the planes in the air.



B-D (bearing-distance) computer navigation can set up any number of parallel courses at any altitudes. At take-off plane proceeds to preselected lane, then turns to fly straight-line course to vicinity of destination. There it again changes course to arrive over airport. Pilot needs to set only three dials on computer before take-off. Errors in resulting readings average less than 1%. The computer is the first instrument of its kind to be actually installed in a plane and flown experimentally. Course offset allows for windage and other variables.

They also want to give them orders. So the annunciators would keep sending signals to the ground, and receiving equipment there would keep tab on every plane aloft.

Identification, position, course, altitude, and speed would be automatically recorded. This, in effect, would provide the counterpart of railroading's automatic block signals. Every aircraft would get a flasher signal from traffic control on the ground if it was getting too close to the tail of the plane in front of it, another signal if the plane behind was getting too close to *its* tail.

It may sound like a third piece of pie after a turkey dinner, but the sponsors of Tricon add that the whole system can be fed into the cockpit autopilot.

Tricon's shortcoming is not one of technical obstacles. Dr. Alvarez says it can be done. What may hold up inauguration of the system or cause outright abandonment of the idea is the expense of its installation. The heavily traveled New York-Chicago direct airway is a case in point. Today it is served by 17 radio-beam stations. Tricon would replace them with no less than 42 master-and-slave stations, plus a number of stand-by transmitters for use if anything got out of kilter.

As yet, Tricon is only on the drafting board.

The other system for more accurate navigation, using Minneapolis-Honeywell's B-D Computer, not only is far simpler, but it has a running start on Tricon. The computer is in experimental use and has been recommended for adoption by the international airline trade association, ICAO.

It is a combination of an electric brain and a bird dog. The brain figures out the answers from all the variables—winds, distance, route, and aircraft speed—and the dog points where to go. The B-D will not do everything Tricon proposes to do. It

won't keep ground stations posted as to the positions, courses, and altitudes of planes in the air. It won't flash red lights if there is danger of collision.

But the company originating it says it will raise today's "one-lane country roads" aloft to the status of 10-lane superhighways. Like Tricon, it will provide aircraft with a large number of flight paths on any given airway. That means added safety. Moreover it can be adapted to automatic landings.

B-D Computer operation requires three elements—the computer itself, a series of omnidirectional radio beacon stations (ODR), and distance-measuring radio transmitters (DME). ODR stations are now being set up by the government.

Can Set Up Hundreds of Airways

ODR differs from the conventional radio beam, emitting "A" and "N" Morse signals to keep a plane on course, in that it sprays a direction-indicating signal out to every point of the compass. Ordinary radio beams provide four airways, no more. ODR could provide hundreds, if necessary. Its freely scattered signal could be only confusing if it were not combined with a cockpit dial and needle pointing unerringly at the transmitting station. A pilot needs only to tune in the proper frequency. The needle says, "There's where you're going."

The needle gives him a line of position. He knows he is on the right road. What he doesn't know is how far along the road he may have come since taking off. So DME, issuing from a ground station too, is introduced. DME is only a variation of wartime's Shoran (PS, Aug. '46, p. 128). DME tells a pilot how far he is from a radio transmitting station. If he already knows he is on the right road, he has all the information he needs.

The beauty of the B-D Computer is that a dispatcher at an airport can send large numbers of airplanes separately down parallel lanes to the same destination. Planes can fly "off course" and remain on course.

A pilot figures his winds, altitude, and the course he has been told to follow before he enters his cockpit. These facts he feeds into the computer. If he is to fly 15 miles off to one side of a straight line between take-off and destination, he turns some knobs and loads the responsibility on the computer.

Then he feeds juice into the device. Instantly it begins digesting two signals—one from ODR and the other from DME. One signal gives him the compass bearing, the other the distance. A pilot can fly by watching the needle on his dial, manipulating his controls to keep it centered, or if he likes he can feed the computer's answers into the autopilot and sit back with the funny papers.

The plane will hold its track right up to its destination, turning from "off course" to "on course" at the proper moment. The computer takes head winds, cross winds, and tail winds in stride, and will switch from one ODR station to the next automatically.

It can be made to do other tricks. It will work a dial giving a pilot his estimated time of arrival at an airport. If he is advised in flight to slow down and come in for a landing 25 minutes later to avoid "stacking," he can consult the computer for the airspeed he should maintain to meet the new schedule. And, ODR, unlike the radio-beam system now in use, isn't affected by static.

The B-D Computer system, too, supplies a third piece of pie on top of the turkey. Just throw a switch. That feeds ILS (Instrument Landing System) signals into the autopilot in place of the ODR signals, and the plane proceeds to land itself. END

Picks Up, Melts Snow

THIS track-riding monster picks snow up and melts it to clear big railroad terminals. Pronged teeth on the spiral sweepers in front whip the snow from the tracks to a pair of conveyer belts, which carry it to a 16,000-gallon tank (behind the conveyers in photo) for melting. When full, the tank dumps the water through two 14-inch valves. The 100-ton snowmelter is in use at the Canadian National Railways' Montreal Terminal.

For package-laden shoppers, an outside foot release opens up the roomy trunk in the nose of this 116-inch-long, 50-inch-high midget convertible. Top is folded above engine in the rear.

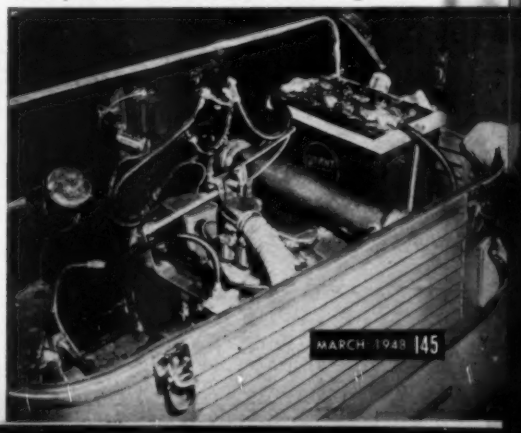
Tiny Car Does Big Job

ONE answer to a shopper's prayers is this miniature, two-person convertible, called the Towne Shopper, soon to be produced by the newly formed International Motor Car Co. Designed for economy, it is priced at $595 f.o.b. San Diego and promises 45 to 50 miles to the gallon at speeds up to 50 m.p.h.

Made largely of aluminum, the flashy little coupe weighs only 600 pounds, is less than 10 feet long, providing easy maneuverability. The compact two-cylinder Onan engine, squeezed under the stub hood in the rear, leaves the larger space in the front for storing groceries or baggage. Whitewall tires, a radio with aerial, and a folding top add the luxury touch.

Broad seat accommodates two, while smart dashboard keeps instruments and controls to a minimum. Despite simplicity, car has automatic clutch, with two speeds forward, one reverse.

The opposed-cylinder, 10.6-hp., air-cooled engine is housed in the rear. Unique flywheel combines generator and starter in single unit. Aluminum cylinders have iron sleeves for longer wear.

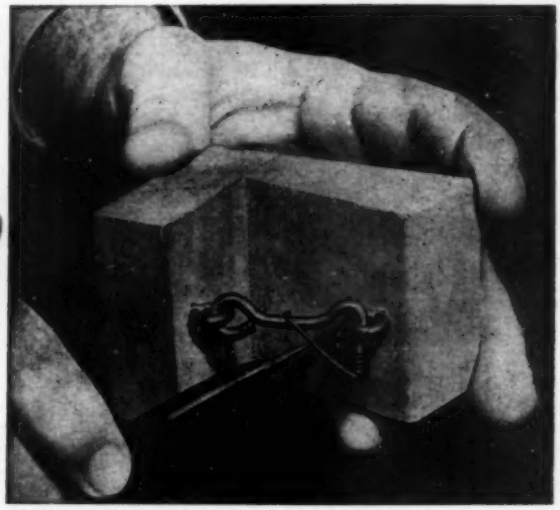


Gadget

By Andrew R. Boone

Youngsters can learn the rudiments of flying on this junior edition of the famed Link Trainer. Miniature stick and rudder bar make model airplane climb, bank, and dive like a real one.

There's less chance of upsetting drinks and ash trays, not to mention added leg room, with this legless bridge table. The four chairs that support it swing outward for easy accessibility.



No burglar can unhook a screen door or window when this tiny coil stands guard. With one end looped around the hook's shaft, the coil can't slip off and keeps the hook from being raised.

No-burble pouring is the boast of this twin-hole can spout. One hole pours liquid, while other lets in air. Its spearlike base is punched into can's top, and a quarter turn locks it in.

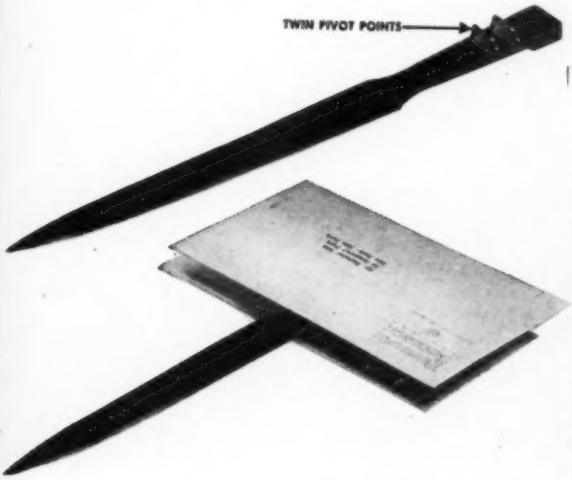
If the phone rings or baby calls, you don't have to set your stirring spoon down on the clean stove. Just slip it into the side of this coil clipped to the pot's rim, and there it will stay.

Grab Bag

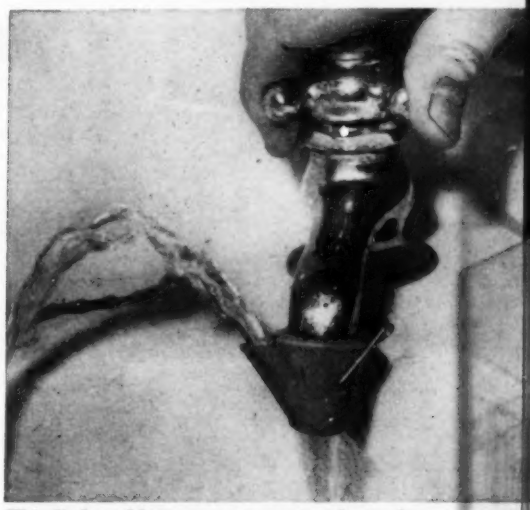
MORE than 400,000 Americans are shelling out from one to five dollars apiece to dip their hands into a monthly, mail-order grab bag. What will come out each month no one knows until the wrapping is off. All they know is that it will be some gadget representing the latest mechanical effort to make life a little easier, safer, or more fun.

What they get depends on whether they have sent in $1.00 for a six-month trial or $5.00 for a year's subscription to a dozen bigger and better gadgets. It may be a comb with a removable wick in its base, a powder fire extinguisher that doesn't deteriorate, or a window-sash burglar alarm.

The gadgets are selected and distributed by the Gadget-of-the-Month Club, Los Angeles, Calif. Anyone can submit an item

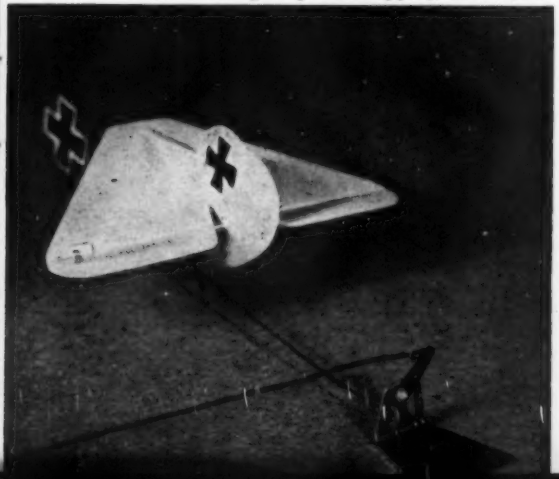


This letter opener also weighs mail. Balancing on twin pivots, it stays tilted down if letter is ounce or less, raises to horizontal if between one and two, tilts up if more than two.

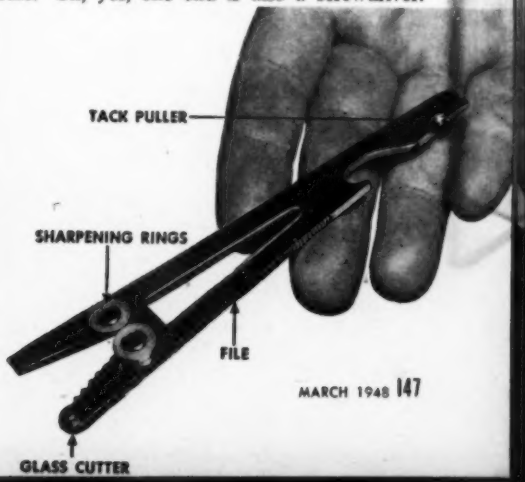


This little rubber spout turns an ordinary faucet into a drinking fountain. Pulling up the wire handle partially closes a valve that sends some of the water arcing out of the spout.

Model planes can get off to a good start with this mechanical starting release. Holding the plane until its engine warms up, it lets it go when a string is pulled tripping the release.



This handy, many-in-one tool pulls tacks, cuts glass, sharpens knives, and takes caps off bottles. One edge is a file, the other a four-inch rule. Oh, yes, one end is also a screwdriver.

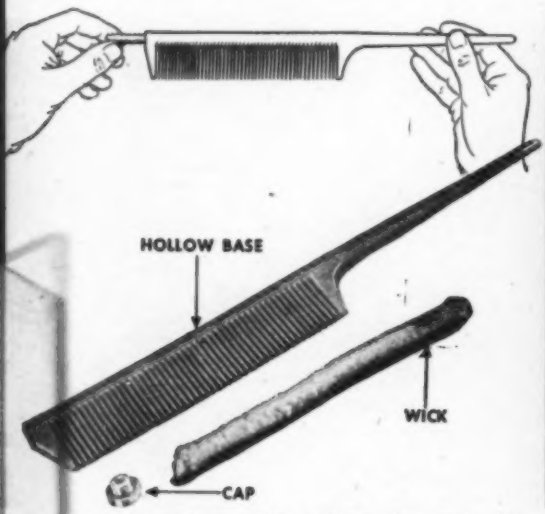


for distribution. There are only three requirements: it must be new, must be patented or patent-applied-for, and must never have been distributed nationally. A jury screens out the best bets, which are then sampled by 15,000 members of the Consumers' Testing League. Those approved by at least 10,000 members are picked for distribution.

The same gadget, however, is never distributed to the full list of subscribers, since the men would hardly go for kitchen gimcracks, and the ladies could not be expected to rave about a razor guaranteed to shave under the nose.

Many of the larger gadgets, of course, some of which are shown here, are too high-priced for the regular subscriptions. These are made available at special prices to club members and later put in retail stores.

Like other monthly "clubs," this is really a merchandising plan. Unlike others, how-

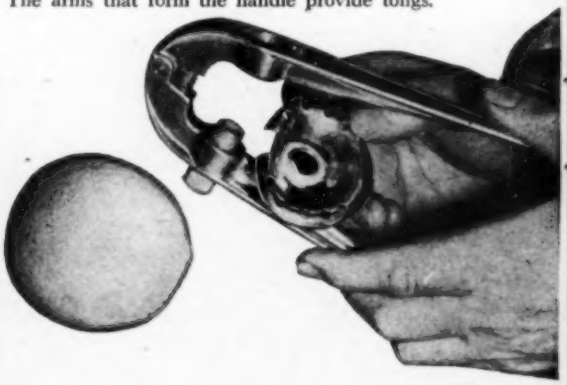


To clean the crannies of this comb, you simply remove the wick in its base and insert a fresh one. Resembling a pipe cleaner, the wick can also be used to comb perfume through the hair.

Blades are quickly picked up from smooth porcelain when touched with the handle of this magnetic razor. Its curved head and goose neck also permit easier shaving of facial hollows.

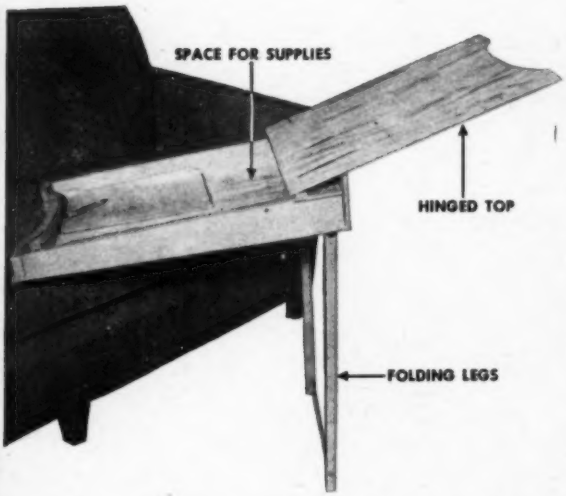
When you hear this bell, it's not Johnny's bike but someone trying to climb in a window. A furtive tug at the sash sounds the alarm; a violent one, and the device jams the window.

This gadget will crack a nut, squeeze an orange, or grapple an ice cube. For fruit juice, the concave pan is screwed onto the set screw. The arms that form the handle provide tongs.



ever, the customer buys blind. The club is also unique in giving inventors an opportunity to develop their brain children for direct introduction to consumers prior to public sale. The club appraises items without charge, suggests possible manufacturers, and itself finances many found worthy.

Springing from the desire of 23 manufacturers to find customers for war-developed items, the club was organized in 1943. Now the National Inventors Assn. and the National Gadgets Mfg. Assn. are joining with the club to stage a National Gadget Week late in April. They plan to establish a community in California called "Gadgetville," where inventors can live and perfect their ideas. In addition, "gadget nooks" will be placed in retail stores across the nation, with a new item featured every week. The nation will become more gadget-conscious than ever if these enterprising gadgeteers have their way. END



Wherever there's a seat, this portable, folding desk can go into action. Just let down the two legs in front and rest the back on your lap. Under hinged top is space for supplies.

Made of plastic, this small fire extinguisher never goes stale. Instead of liquid, it contains a powder that smothers flames with carbon dioxide. Powder is guaranteed to last a lifetime.

It's only a short rubber hose, but with one end on the faucet and the other wedged down a clogged sink drain, it forces water into the drain at nearly pipe pressure to help clear it.

Here's an orange peeler that doesn't spoil the juicy parts. A circular cut is first made with the handle's edge; then the long, curved wire, slipped underneath, easily strips off the skin.

1 When Sgt. F. G. Brown—one of the winterized paratroopers of the 505th Airborne Battalion Combat Team—poises himself for a combat jump over snow country he weighs close to 310 lb., about double his normal weight. During Exercise Snowdrop at Pine Camp, N. Y., this past winter, members of the 505th learned cold-weather combat operations.

4 The second equipment bundle contains ammunition for the mortar. Both bundles must be retrieved and unpacked quickly. Paratroopers in these photos are wearing snowshoes.

5 All equipment is packed on the sled so that it can be hauled to the battle area. Besides learning how to ski and snowshoe, the men of the 505th had to learn how to pack a sled.

He's a Flying Snowshooter

The parka-clad paratrooper is a new kind of soldier. He can jump in a blizzard and fight in a freeze.

By George H. Waltz, Jr.
PS photos by W. W. Morris

SGT. F. G. Brown is one of a new kind of soldier in Uncle Sam's Army. Besides being a crack air-delivered infantryman, he now is winterized and has added a good many new cold-weather fighting tricks to his already full bag of military know-how.

"Brownie" is a member of the 505th Airborne Battalion Combat Team with whom I shivered for several days this past winter. Up at Pine Camp, near Watertown, N. Y., he and the rest of the 505th were testing themselves, their weapons and their equipment, and their ground tactics, under rugged sub-freezing combat conditions. The three-month-long maneuver, known as Exercise Snowdrop, was a continuation of previous cold-weather operations Frigid,

2 After a paratrooper hits the snow, his first job is to get out of his gear as quickly as he can. In a well-timed jump, troops and cargo 'chutes will land close together.

3 A mortar squad like the one Sgt. Brown commands is serviced by two equipment bundles. The one shown above contains an 81-mm. mortar, **skis,** and an easily assembled sled.

6 The mortar squad is packed and ready to trek. Men replace sled dogs on most paratroop combat missions. The three men pulling the sled are wearing special canvas harnesses.

7 Set up and ready to fire. The men work with split-second teamwork. A crack crew can assemble a 75-mm. howitzer and have it ready for firing in less than seven minutes.

Frost, and Williwaw. Unlike these three previous general operations, however, Exercise Snowdrop was designed principally to test the use of airborne troops and the tactical planning peculiar to large-scale airborne operations.

Basically, Sergeant Brown, like a good many of his mates, is a paratrooper, a job he learned to put to good use in World War II. But during Exercise Snowdrop, he had to learn to ski, snowshoe, pack a sled, keep warm, care for his equipment and weapons in freezing weather, and to apply his fighting tactics to terrain covered with ice and snow. All this in addition to keeping his hand in at his basic trade—parachuting to the ground with his full load of combat gear.

Being a paratrooper under ordinary combat conditions is no job for a softy, and in cold weather, freezing winds, and snow it's twice as tough. Take Sergeant Brown as an example: dressed in his ordinary, indoor uniform, "Brownie" tips the scales at about 165. But for a winter combat jump he is dressed in 35 lb. of special cold-weather clothing and wears 40 lb. of parachutes (a main back pack and a reserve chest pack). Add a 60-lb. rucksack, plus snowshoes and other odds and ends of weapons and equipment. Now he weighs close to 310 lb.—just about twice his normal weight—as he snaps his parachute static line on the overhead anchor line and waddles up to the jump door of his transport plane.

Two-a-Second Bail Out

Yet, even though hampered by that much bulky gear, he and his combat jump mates can bail out of their low-flying plane at the rate of two men every second. Three planes dropping full complements of men and equipment can saturate the air over a "drop zone" (paratroopers call it the DZ) with parachuting men and weapons.

During Exercise Snowdrop, the 505th used Fairchild C-82 Packets flown by Troop Carrier Command personnel. Lugging 42 paratroopers and their equipment, the C-82 is well suited to airborne operations. Twin jump doors at the rear of its fuselage allow two parallel lines of paratroopers to walk off the plane simultaneously.

Another feature, a special electric monorail method of handling the equipment sent down with the men, drops as many as 15 bundles or "paracans" automatically through its bomb-bay doors in eight seconds (PS, July '47, p. 111). The 14 paracans required

Sgt. Brown and the gear he wears for a winter jump. Ordinarily he tips the scales at about 165. Here he has already added 1 lb. 8 oz., in the form of 3 pairs of ski socks and a heavy underwear shirt, to his basic uniform of cotton underwear, shirt, pants, and web belt.

Two main essentials to a paratrooper—his main back pack parachute and his reserve chest pack parachute—add another 40 lb. The back pack alone weighs 28 lb.; the chest pack 12 lb. The back pack is opened by a static line that the sergeant attaches to an anchor line in the transport plane before he jumps.

2. PLUS 8 LB., 5 OZ.

"Brownie's" weight builds up fast as he gets dressed for frigid jump weather. In this photo he has added his combat pants (1 lb. 8 oz.), ski boots (6 lb. 2 oz.), and is lacing up one of his ski gaiters (the pair weighs 11 oz.). The ski boots also double as mountain shoes.

3. PLUS 7 LB.

A combat jacket, white reversible parka, and white ski pants add another 7 lb. So far Brownie's weight has been boosted 16 lb. 13 oz., and he still has a long way to go. In the photo sequence starting at left below, he puts on weight in really big chunks.

5. PLUS 13 LB.

No fighter is complete without his personal weapons. Here Brownie is shown fastening in place his Garand rifle contained in a Griswold pack, weighing 9 lb. His pistol, belt, and holster weigh still another 4 lb. A winterized paratrooper can carry his ammunition either in bandoleers or stowed in his rucksack.

6. TOTAL: 307 LB., 5 OZ.

After putting on another 72 lb. 8 oz., Brownie is ready for a snow-country combat jump. The rucksack that he wears in front strapped around his waist adds 46 lb. 8 oz. It contains, besides his personal gear and clothing, such things as first-aid kit and an axe. The bear-paw snowshoes account for 5 lb. 8 oz. of the total.

for the separate parts of two complete 75-mm. pack howitzers can now be dropped in the time formerly required to drop the parts for one. As a result, weapons and men hit the ground within a small concentrated area at about the same time.

Although snow and cold make the airborne soldier's problem more difficult, they do not change his purpose. The new winterized paratroopers are the advance men—the shock troops—in any over-snow operation. Their job is to land and hold their positions until an airhead can be established and supporting troops can be brought in by glider or transport plane.

When he lands, the snow paratrooper must be equipped to fight and live even though he may not be able to reach an equipment bundle. Beside clothing, rations, and sleeping bag, he must carry snowshoes, a rifle and ammunition, hand grenades, entrenching tools and, depending on the mission, even tank mines. He hits the snow a complete fighting unit capable of protecting and sustaining himself for several days.

In a typical paratroop operation heavy armament in the form of 81-mm. and 60-mm. mortars, 30-cal. air-cooled machine guns, and 75-mm. howitzers is parachuted to earth along with the men and their bundles of skis and sleds. In a recent test, a complete 105-mm. howitzer plus a jeep—a total load of 13,000 lb.—was successfully parachuted from a single C-82. Even a weasel, one of the Army's best snow-maneuvering vehicles, can be dropped to snowbound paratroopers.

What happens when the first waves of paratroopers have established their positions was illustrated by the final phase of Exercise Snowdrop, just completed. All the supplies and men needed for the building of an airstrip, including landing mats and vest-pocket bulldozers and tractors, were brought in by gliders. Then, when the airstrip was completed, heavy transport planes flew in additional supporting troops. Finally came the bombers, fighter planes, and more C-82s to launch another theoretical steppingstone attack. An airhead had been successfully established.

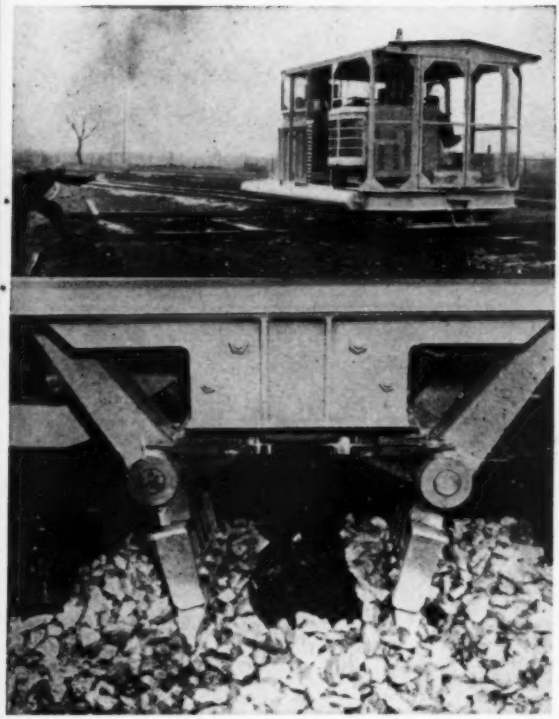
Uncle Sam's new winterized paratroopers have their peacetime as well as wartime uses. Recently, when an Army C-54 (DC-4) crash-landed near Goose Bay, Labrador, paratrooper medics flew to the rescue in a helicopter-carrying C-82. All six survivors were brought out alive. END

Orchards Get Smokeless Heat

SOUTHERN fruit growers can now fight frost without getting smoke in their eyes. The pall of smoke pouring from ordinary smudge pots and orchard stoves plays no part in protecting the fruit, says Floyd Davis, of Denver, Colo., inventor of the smokeless orchard heater shown at right. So he designed a stove that in eliminating smoke produces more frost-killing heat.

The smoke or smudge produced by most burners is caused by rapid collection of carbon: the longer they burn, the more they smoke. In the Davis burner, on the other hand, the stack is swept free of soot by a continuous blast of air sucked in through holes around the bottom. In one experiment a Davis burner, kept going steadily for almost three months, collected less soot than the average smudge pot would in an hour. What little carbon does collect actually makes it burn better. The final stamp of approval came from Mrs. Fruit Grower. The stove was within 50 feet of an open dining room window, and her curtains didn't need an extra laundering.

Trick of turning smoke into heat is all in the burner unit shown at center, above. With the stack in place, cold air is drawn through the hole in the center of the lower overflow plate. This prevents oil in the burner plate from overheating and vaporizing without proper combustion. Thus most of the smoke is eliminated. The upper overflow plate, acting as a cold-air baffle, keeps the oil from chilling too much.



Ties Tamped Tighter

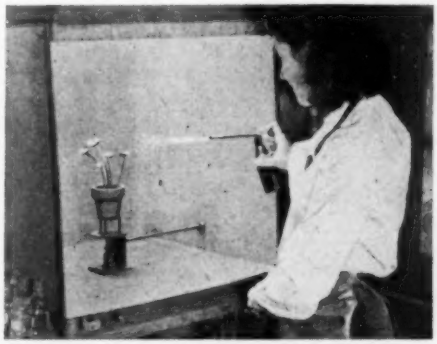
If your railroad ride is smoother today than it was during the war, thanks may be due this new ballaster (at left, above) that automatically tucks in ties to make for an easier-riding roadbed. Close-up (at left, below) shows how stone, gravel, or cinder ballast is fed from car above and rammed down by two sets of 16 tamping shoes to straighten a crooked tie.

Moving along railroad tracks under its own power, the Pullman-Standard ballaster can cover up to a mile a day, or four times the trackage ballasted by a double crew operating conventional hand-powered tampers. The tamping shoes are attached to a crossbeam that spans the length of the ties. This beam is lifted by a 100-horsepower gasoline motor and dropped with pile-driver action, forcing the ballast underneath the ties.

When a through train whistles its approach, the ballaster car literally lifts itself off the main line. As four compressed-air cylinders hoist the machine off the tracks, side rails are slid under auxiliary wheels located beneath each end of the car, as shown at top. The ballaster then moves sideways, leaving the right-of-way clear.

Auto Delivery Speeded

With double parking on top, this new "haulaway" truck loads up with nine Crosley station wagons, three more than was possible with older equipment. Three of the cars ride inside the trailer's steel framework. Six more are stowed in a double row on the upper deck. With delivery a bottleneck, the new auto hauler was developed by Crosley engineers in conjunction with the Kenosha Auto Transit Corporation.



New Spray Fights Mites

A new spraying partner of DDT has been developed by the American Cyanamid Co. When DDT is used on plants and field crops, it kills insects that feed on mites. But then the new insecticide, O, O-diethyl O-p-nitrophenyl thiophosphate (called Thiophos 3422Ⓣ for short) takes over and kills the mites. Shown above being used experimentally, the new product has proved effective in killing mites on many fruit crops.

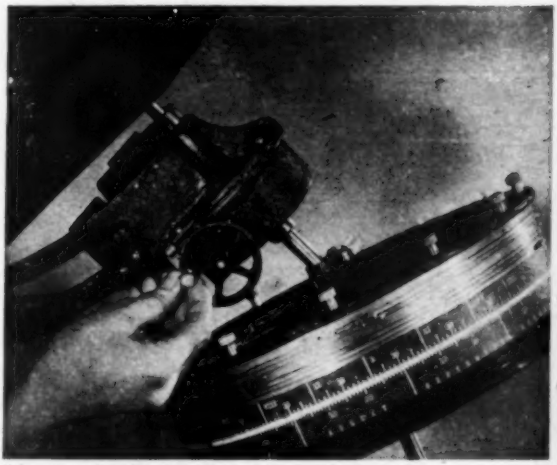
$500 Buys a Real Planetarium

RISING and setting of the sun, moon, planets, and starry constellations are realistically depicted upon the ceiling of a darkened classroom by a half-pint planetarium just placed on the market. It gives the same sort of dramatic show, on only a slightly more modest scale, that costly multi-lensed projectors offer thrilled spectators in the famous planetarium buildings of the world's great museums. These big custom-built projectors, constructed before the war by the Zeiss optical firm for about $200,000, would cost about $1,000,000 to build today. In contrast, the new popular-priced model sells for only $500, bringing it within the reach of schools and amateur astronomers.

Standing only three feet high and weighing less than 25 pounds, the midget planetarium plugs into any AC wall socket. A flick of its light switch, and it paints the room's ceiling with all the stars down to the fourth magnitude—in other words, most of those that the naked eye can see. Throwing another switch turns on an electric motor that sets the stars moving across the field of view, overhead, just as they actually march across the night sky. This effect is heightened by speeding it up; the projector reproduces the changing aspect of the heavens during a twenty-four-hour period in four minutes' time.

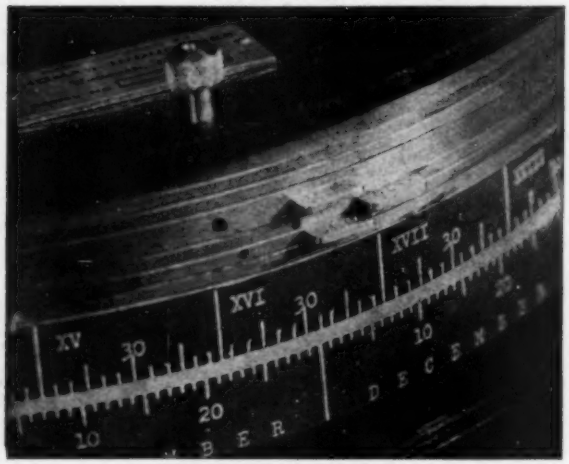
The inexpensive planetarium, made by Science Associates, of Philadelphia, resulted from an ingenious lensless and economical design worked out by Armand Spitz, of the Franklin Institute. Its 12-sided star projector, a perfectly satisfactory approximation to the "ideal" shape of a globe, is comparatively simple to manufacture. Rays from an automobile-headlight bulb, within, stream through tiny, accurately positioned holes in opaque plastic panels to form the star images. Holes of various sizes represent stars of different brightness. A drum-shaped projector, on the same motor-driven shaft, similarly forms images of the planets. Simple adjustments preset the instrument to portray the celestial spectacle at any latitude and season.

Any school can now afford to own a planetarium. Miniature type above, inexpensive and scientifically accurate, sells for only $500. Odd-shaped, 12-sided object is its star projector.



Turning hand wheel, as above, rotates projectors to position for any hour of day or night. Electric drive, behind wheel, runs off the whole show automatically. Drum at lower right is planet projector, mounted at correct angle to show path of planets in plane of ecliptic.

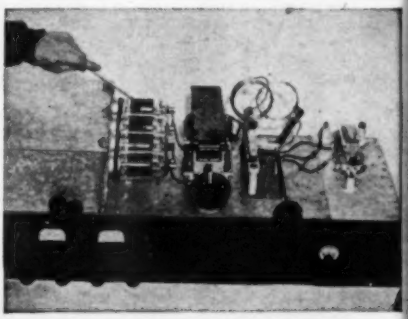
Miniature planetarium in action realistically reproduces stars of night sky, including the two Dippers (at upper right). Images may be thrown on ceiling, wall, or portable dome.



Holes in rims of individual metal rings transmit beams of light from headlamp bulb, within, to project the images of the planets. Rings are preset to correct positions, by tabs marked with names of planets, with aid of calendar scale around the drum of the planet projector.

New Microscope

THE Pan-Tec Microscope ⓣ above is designed to fill the gap between high-priced instruments and toys. Said to be optically adequate for the most exacting low and medium magnifications, it is equipped with a substage condenser. Two eyepieces and two objectives give a choice of 24, 48, 96, or 192 diameters. Complete, it sells for about $40.



Sideband for Hams

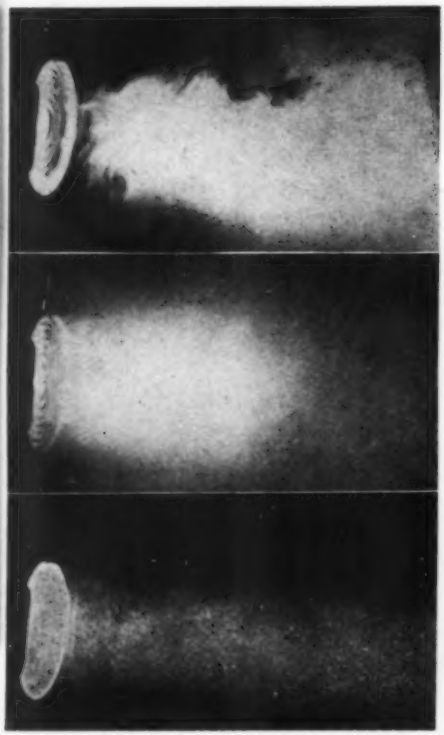
ABOVE is part of something new in ham radio—a single-sideband transmitter. Usually, the sidebands occupy the space on both sides of a radio signal's carrier wave: eliminate one of them and two stations can operate where only one could before. Previously it was used only commercially, but this simple, new Stanford design can be built by amateurs.

Checking equipment about to be tested under Arctic storm conditions. Before the snow maker is turned on, the test chamber is chilled to remove heat stored in air, walls, and floors.

Made-to-Order Blizzard Blows at 40° Below

WHEN Signal Corps test engineers at Fort Monmouth, N. J., say it's going to snow, it's so. They ought to know: they make their own—indoors. These man-made blizzards are whipped up in a new climatic chamber the size of a four-room house, big enough for several observers to watch a variety of signal equipment under test.

Ammonia compressors, powered by more than 700 hp. of electric motors, maintain a constant temperature of **40° below** zero in the room. When high-temperature steam is injected, it cools rapidly, forming a supercooled cloud similar to those found in nature. When the cloud reaches about **10° above** zero, a tiny bag of dry ice is shaken into it. It continues cooling, and at minus **40°**, billions of microscopic snow crystals are formed. Colliding in the moving air, these crystals form small snowflakes. A high-speed propeller creates winds of blizzard velocity. A recent three-day snowfall reached a depth of almost four inches.



Live steam (top) is injected into the 40° below blizzard room. The steam forms a supercooled cloud (middle photo). Dry ice is added, crystallization sets in, and snow falls (bottom).

After the storm is over, technician dressed in fur-lined parka inspects signal equipment to see how it has weathered the blizzard. It takes at least 36 hours to produce a good snowfall.

Dreams of the ancient alchemists come true in the chain-reacting pile at Oak Ridge, Tenn.

U. S. Alchemists Make Gold

Applying atomic magic to aid medicine and research, radiochemists duplicate nature's elements and create new ones.

By Alden P. Armagnac

Drawings by Ray Pioch

AT Oak Ridge, Tenn., the United States Atomic Energy Commission has gone into the business of manufacturing synthetic gold. The atomic pile is the Philosopher's Stone, long sought by the ancient alchemists, which has the 24-carat touch.

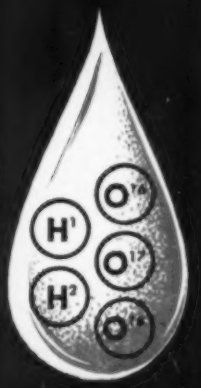
Most curious part of the new enterprise is the odd behavior of the man-made gold. Though locked in the strongest vault, most of it would disappear within a week's time. Strange to say, this extraordinary way of acting actually enhances the gold's value. What makes it so desirable is the fact that it is radioactive. Hence the ray-emitting "radiogold" offers medical men a priceless tool for treating such maladies as leukemia, lymphoma and Hodgkin's disease. At one institution alone, Vanderbilt University Medical School in Nashville, Tenn., it has benefited 61 patients in the first year of use.

For therapy and for "tagging" chemicals used in research, Oak Ridge's alchemists—or "radiochemists," as they call themselves—produce scores of artificially radioactive elements like radiogold. But they are by no means limited to "freak" products that have no counterpart in nature.

THE OLD AND THE NEW IN "ELEMENTS"

1. In ancient times, alchemists believed that a drop of water represented the simplest imaginable kind of a substance. Water, they thought, was one of the fundamental and indivisible "elements" of which everything in the world was made.

2. Then chemists discovered that water was a combination of simpler "elements." Taking it apart, they found it to be made up of two dissimilar substances, hydrogen and oxygen, in the proportions indicated by the familiar formula, H_2O.



3. Now 20th Century alchemists find that water actually consists, not merely of two ingredients, but of five! Its "elements," hydrogen and oxygen, turn out to have different varieties or isotopes, shown here with their identifying numbers.

Just as easily, they can manufacture gold of normal behavior, perfectly acceptable to the U. S. Treasury! It may not be the best way to get rich quick—the raw material, as for radiogold, is platinum—but the fact that it has been done illustrates their prowess in transmuting the elements. If future generals and geologists worry no longer about strategic materials and dwindling natural resources because alchemists can make any wanted element from others, it will be hardly more fantastic than what has already been accomplished.

Behind the scientists' amazing feats with cyclotrons and atomic piles lies a new understanding of the make-up of matter.

Chemists once believed that ninety-odd substances such as hydrogen and oxygen, called elements, were the ingredients of every material you could name—air, water, flesh, blood. All the atoms of each element, they thought, were just alike.

Varieties of Elements Discovered

Now the list of the world's ingredients has been multiplied many times by the discovery that these elements have important varieties, called isotopes. More than 700 different isotopes are known today. Those of the same element give the same chemical reactions in a test tube, but they differ in weight and in more spectacular ways. You can safely handle any amount of uranium 238, one of the isotopes of uranium. Merely bring together something less than 220 pounds of another, uranium 235, and its spontaneous explosion will level a city. Some isotopes are stable. Others, even of normally well-behaved elements like iron and sulphur, may turn into something else while your back is turned!

Resembling a gigantic crossword puzzle, a remarkable "isotope chart" recently compiled by Prof. Emilio Segrè, of the University of California, graphically illustrates the new idea of what things are made of. Rows and columns of squares form a pattern ascending diagonally from left to right. Horizontally, the chart ranges in order the 96 elements now known. Vertically, it shows all known isotopes of each element. Some squares even have double entries for "twin" isotopes having the same weight but different radioactive life. Counting these, the 720 filled-in squares have 785 entries in all.

It looks pretty complicated, until you notice the beautifully simple relationship that the new chart reveals. Just two kinds of

NEW CHART OF THE ELEMENTS

This is the way the latest-style diagram begins. Whole chart, to same scale, is five feet long and has 785 entries. They show all known isotopes of the 96 elements and their amazingly simple relationship. All are combinations of only two ingredients, protons and neutrons.

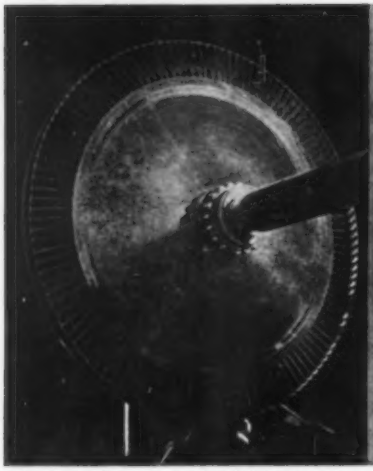
	ONE PROTON	TWO PROTONS	THREE PROTONS	FOUR PROTONS	FIVE PROTONS	SIX PROTONS	SEVEN PROTONS	EIGHT PROTONS
ELEVEN NEUTRONS								OXYGEN 19
TEN NEUTRONS								OXYGEN 18 0.20%
NINE NEUTRONS							NITROGEN 16	OXYGEN 17 0.04%
EIGHT NEUTRONS						CARBON 14 TRACE*	NITROGEN 15 0.38%	OXYGEN 16 99.76%
SEVEN NEUTRONS					BORON 12	CARBON 13 1.1%	NITROGEN 14 99.62%	OXYGEN 15
SIX NEUTRONS				BERYLLIUM 10	BORON 11 81.6%	CARBON 12 98.9%	NITROGEN 13	
FIVE NEUTRONS			LITHIUM 8	BERYLLIUM 9 100%	BORON 10 18.4%	CARBON 11		
FOUR NEUTRONS		HELIUM 6	LITHIUM 7 92.5%			CARBON 10		
THREE NEUTRONS			LITHIUM 6 7.5%	BERYLLIUM 7				
TWO NEUTRONS	HYDROGEN 3	HELIUM 4 99.99+%						
ONE NEUTRON	HYDROGEN 2 0.02%	HELIUM 3 TRACE						
NO NEUTRONS	HYDROGEN 1 99.98%							

STABLE ISOTOPES

RADIOACTIVE ISOTOPES

(PERCENTAGES SHOW AMOUNT OF EACH ISOTOPE PRESENT IN THE NATURAL ELEMENT)

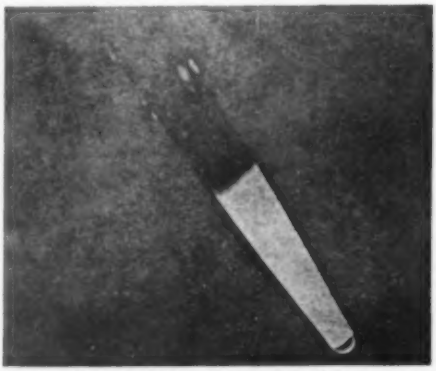
* RECENT EXPERIMENTS INDICATE THAT A TRACE OF RADIOACTIVE CARBON 14, CONSTANTLY FORMED FROM ORDINARY NITROGEN 14 BY COSMIC RAYS PENETRATING TO THE EARTH'S SURFACE, IS NORMALLY PRESENT IN THE HUMAN BODY AND IN ALL LIVING MATTER.



Elements long considered laboratory curiosities sometimes meet vital needs. Columbium metal is an example. Used in heat-resisting alloy for blades of turbine wheel at left, it has made possible the jet engines that drive world's fastest planes like Navy's Skystreak, right.

particles, it shows, make up every one of the 785 varieties and subvarieties of elements. One is the proton, the positively charged core of the hydrogen atom, discovered in 1886. The other is the neutron, an electrically neutral particle, discovered in 1932. These two particles are the true building blocks of the universe.

Join the right number of protons and neutrons to make the core or nucleus of an atom—a neat trick if you can do it—and you will have any isotope of any element you want. The number of protons determines what the element will be. One proton makes hydrogen, two make helium, and so on up to 96 for newly discovered curium. The *total* number of particles, protons plus neutrons, determines what isotope you will get. This is the number, therefore, that you write after the name of an element to identify a particular isotope. It's all as simple as that.



Newly discovered curium, most dangerous to handle of all elements, is so violently radioactive that it bubbles and glows in this hollow glass needle. Photo was made by element's own light.

To apply this idea and perform a bit of alchemy, you need only walk near an operating cyclotron with a little loose change in your pocket. For a while afterward, all your dimes and quarters will be radioactive enough to make a Geiger counter click. Subsequently, they'll contain a trace of cadmium metal that the U. S. Mint never put there.

What has happened? An atom of silver in the coin—say silver 107, which has 47 protons and 60 neutrons—picks up another neutron from the cyclotron. The result is silver 108, the isotope that contains one more neutron than silver 107. It is radioactive and emits a negative electron, or beta ray. As it does so, one of its neutrons turns into a proton. It therefore becomes cadmium, the element that has one more proton than silver; and the isotope is cadmium 108, which is stable.

Wizards of Oak Ridge similarly produce "radioisotopes" (radioactive isotopes) of elements ranging from antimony to zirconium. Given time, they could change the world around pretty radically, since all their radioisotopes eventually turn into stable elements—and these are usually quite dif-

ferent from the elements they started with.

Naturally radioactive elements can also be duplicated. Polonium 210, the natural form that turns into lead, has been produced from bismuth in a high-voltage atom gun at the University of Michigan.

Awe-inspiring to earlier chemists was their powerlessness to start, stop, or control in any way the radioactive process that in nature's own good time gives birth to the various members of the radium, actinium, and thorium families. It could neither be hastened nor retarded by the most potent forces they could bring to bear—the searing heat of the blast flame, the frigid cold of liquid air, or the crackling discharge of millions of volts of electricity. But now the great 184-inch cyclotron of the University of California has shown how to give nature a boost. It turns uranium directly into a remote member of the actinium family, Actinium X—a process for which nature requires five successive steps and, on the average, more than 700,000,000 years!

In 1939, a cyclotron yielded a radioactive metal new to science—technitium, the first element to be discovered by its artificial creation. All newer elements, except francium, have come from the cyclotron and atomic pile—astatine, neptunium, plutonium, curium, americium, and prometheum. Plutonium, of atom-bomb fame, was also the first synthetic element made by the pound.

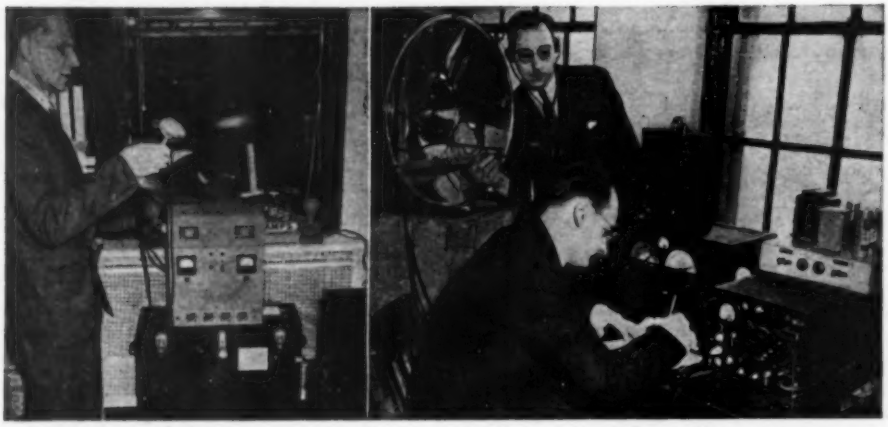
Prometheum and technitium, the two synthetic elements believed most surely absent in nature, now are available from Oak Ridge. Substantial quantities could be produced as by-products of future atomic-power piles, if experimenters find they have important practical uses.

These men may well bear in mind the success story of the "Cinderella" element, columbium. As late as 1928, making a disk the size of a half dollar would nearly have exhausted the world's supply of this steel-gray metal. In 1929, a Chicago chemist proudly exhibited the first rods and plates of columbium—and frankly admitted he couldn't imagine any use for them. Today, as a result of wartime research, columbium has become indispensable. It forms a small but essential fraction of a heat-resisting alloy for the turbines of the world's fastest jet planes. Any one of the newest elements made by alchemists may likewise prove a necessity in the world of tomorrow. END

AMATEUR ALCHEMY

To duplicate the radiochemists' magic, you only need a dime and a chance to walk near a cyclotron in operation. A silver coin in your pocket will become radioactive enough to make a Geiger counter click. A trace of cadmium will be left in your coin.

Here's what happens. A silver atom in a coin picks up a stray neutron from the cyclotron and is transformed into a radioactive isotope of silver. Then it ejects a negative electron or beta ray, and becomes cadmium metal as one of its neutrons turns into a proton.



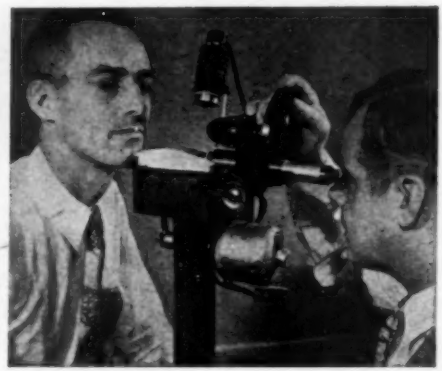
Invisible Light Talks

THIS modern Aladdin's lamp doesn't need magic to talk; its "voice" is built in. As the man in photo above, at left, talks into a microphone, the sound waves are changed into electrical waves and fed into the "talking lamp" and reflector outside the window. The lamp alternately dims and brightens thousands of times a second, sending out invisible infrared radiations. At a station three-quarters of a mile away, above at right, this "light talk" is beamed to a reflectorlike receiver. With the aid of a sensitive photocell, seen just above the seated operator's right hand, the message is reproduced into spoken words.

The tubular lamp that does the job is filled with argon gas and caesium vapor. Developed by Westinghouse for secret Navy wartime communication, this "beamcasting" cannot be jammed, and is unaffected by static. One suggested peacetime use is for disaster areas where other communications lines have been cut by weather conditions and ordinary broadcasting is impossible.

Cold Storage Time

THERE's not much point in keeping your watch in an ice tray as shown above, except to prove that new nonfreezing lubricants developed by Cities Service Co., enable it to tick away in sub-zero weather. But polar explorer and winter motorist alike will benefit from these special lubricants, some of which remain fluid at 70° below zero.



Watching a Close Shave

How smooth is an electric-razor shave? That's what Schick Electric Shaver engineers are finding out with this gadget. As the razor's shearing head clips whiskers at 8,500 r.p.m., motion appears to stop when the disk held in the technician's hand is revolved at the same speed. This permits close examination of shaving performance.

Driving this electric clock is the small, can-shaped motor between bolts. Rest is gearing.

Electric clock motors may cost only 25¢, give 10 millionths of one horsepower—yet they keep perfect time.

By Benj. F. Bailey

Professor Emeritus of Electrical Engineering, University of Michigan

A 50,000-HP. electric motor may drive a big ship, a 5-hp. motor may turn a lathe, and the dentist can do his dirty work with a drill driven by a motor of perhaps 1/100 hp. But what can a *fly-power* motor do? For one thing, it can drive an electric clock or any other small device that must run at constant speed, such as a meter, recording instrument, or time switch.

I don't know how much power one fly-power is, but I have no doubt a healthy fly could operate an electric clock. Tests made about 25 years ago show that the actual power required to run an ordinary house clock is about two-billionths hp. Some of the clock motors I have tested showed outputs 5,000 times greater—about 10 millionths hp.—certainly an ample margin. And although these motors have a low efficiency (much less than 1%), the cost of power is only about one cent a week.

Such a motor is neither complicated nor expensive. The simplest form can be manufactured and sold at a profit (in large quantities) for as little as 25 cents. Motors of this kind have been on the market for about

This motor, from a self-starting electric clock, has a rotor made from a narrow spring-steel band snapped into an aluminum flywheel shown above, at right. Stator, of notched iron, is at left.

20 years but were invented long before that. One was patented in 1894 by a German, Carl Coerper, while a similar motor by La Cour dates back to 1868. This particular one did not use alternating current; in fact, the inventor probably did not know it would run on AC. He used an interrupted direct current timed by a tuning fork.

It is hard to imagine a simpler motor than this type. The rotor is a notched disk of soft iron, either solid or laminated, about ¾ to 1¼ inches in diameter and perhaps a little more than 1/16 inch in thickness. The stator (really technically the armature) is usually laminated, but it operates well even if solid. The exciting coil consists of a few ounces of very fine wire. This completes the motor, except for the shaft and bearings.

Runs at Constant Speed

This is a single-phase, synchronous motor and it runs at absolutely (I don't mean nearly) constant speed as long as the frequency of the current is constant and the load is not too great. If overloaded, it stops completely and must be started by outside power before it will run again. Its speed is such that any given tooth moves ahead to the position occupied by the next tooth in one-half a cycle. Thus, on a 60-cycle current, a rotor with six teeth makes a complete revolution in three cycles, 20 revolutions a second, or 1,200 r.p.m. Being perfectly symmetrical with respect to the poles, it runs equally well in either direction.

What makes such a simple device run? When it was first proposed, many electrical engineers declared it would not run at all. It looks as though each tooth would be first pulled ahead and then pulled back. This actually occurs, but fortunately it is pulled ahead harder than it is pulled back. If a rotor tooth were directly in line with a stator tooth at the instant of greatest magnetic force, there would be no resultant pull. Actually, the stator tooth arrives there a little later, and is consequently pulled ahead while the force is strong, and backward while it is weak. Thus the forward pull is greater than the backward pull, and the motor keeps running; the rotor's inertia carries it over the positions of back pull.

Off to a Bad Start

When first used to drive clocks, in 1896, this type of motor was a flop. It was difficult to start, and it did not keep good time after it was started. Otherwise it was all right. In other words, further improvements were needed. To start it you hand-twirled the rotor somewhat above synchronism. At some instant as it slowed down, it was at exactly synchronous speed. If at that instant the poles were exactly where they should be to develop maximum pull, the motor would "take hold" and run indefinitely. In practice, however, it usually was not near enough to the best position, and the motor stopped.

Actually, a method of overcoming this starting difficulty had been invented by the aforementioned La Cour. He used a hollow flywheel partially filled with mercury. A later and better idea was to mount a very light flywheel loosely on the shaft but connected to it by a light friction clutch that slipped easily. In still another, the flywheel was connected to the shaft by a fine spiral spring. With any of these devices, the rotor could change its speed momentarily without accelerating the flywheel.

In another very simple starting device, the slots on the rotor (or stator) are angled to allow plenty of end play in the shaft bearings. Then, if the rotor is not in the best running position when it reaches synchronous speed, magnetic force of the teeth will pull it endwise into such a position.

Such a motor is not self-starting. A self-

starting motor has the advantage of convenience. But if the current is interrupted for a few minutes, it will start as soon as the power is restored and will be several minutes slow. In some self-starting clocks little red warning disks appear on the face if the current stops. A few have an auxiliary spring-driven movement that takes over until the power comes on again.

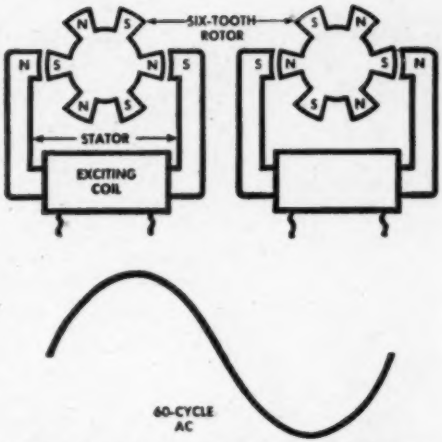
There are many forms of self-starting motors. One common type uses bands of copper, called shading coils, to make the magnetic field of the stator rotate. This rotating field causes the north and south poles in the disk-shaped rotor to move around with the field, creating a pull that brings the motor up to synchronous speed. Once the rotor is in synchronism, its poles usually hold their position. Sometimes they may shift, however, slowing the rotor below synchronism. This loss of speed can be prevented by mounting a rectangular bar of hard steel on the rotor shaft, close to the rotor. Since poles of a bar cannot move around like the poles of a disk, the bar always stays in synchronism, and holds the disk in synchronism.

With these improvements, a good motor was available, but its accuracy was no greater than that of the frequency of the electrical system to which it was connected. If the current alternated at 60.6 cycles instead of precisely 60, every clock would gain about 15 minutes a day.

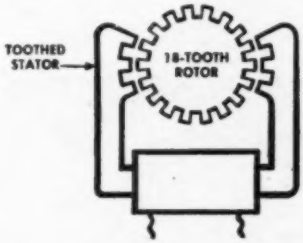
Frequencies Must Be Controlled

Before electric clocks could be generally used and sold, the current frequency had to be held between about 59.994 and 60.006 cycles (in a 60-cycle-AC system). This is done in the powerhouse by having a high-grade pendulum clock and an electric clock. The attendant keeps the two regulated by varying slightly the speed of the steam engine. In up-to-date powerhouses, this adjustment is automatic. Once a day, perhaps, the pendulum clock is corrected by checking time signals from Washington.

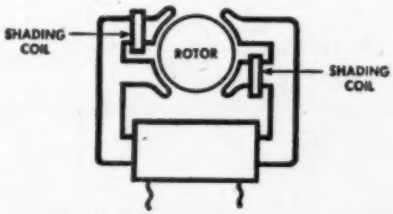
Before closely controlled frequencies became available, however, someone had to convince the power companies that the expense was justified. Once one or two large companies started to provide closely regulated frequency, others quickly fell into line. Now most companies provide excellent time service. Today, even the cheapest electric clock keeps better time than an expensive pendulum clock. END



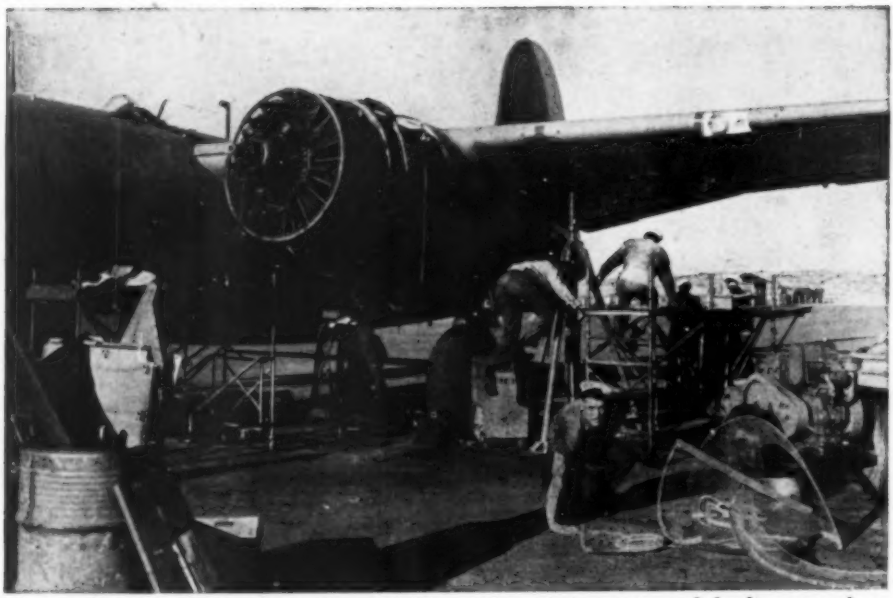
When alternating current is at its maximum, the poles are about as shown here, and the pull is strong. Beyond this point the pull is backward, but the current is weaker. Thus the forward pull is greater than the backward pull, and therefore the motor continues to run.



Notches are cut in the rotor to increase the number of poles and reduce its speed. The rotor moves two notches for each current cycle, so the above 18-notch rotor turns 400 r.p.m. Notches in the stator increase the pulling power of the motor but do not change the speed.



One kind of self-starting synchronous motor has a shading coil around half of each stator pole to make the magnetic force in the shaded half lag behind that in the unshaded half. A rotating field results, pulling the rotor poles with it and exerting a force that starts the rotor.



The wrecking crew begins dismantling an A-26 bomber, which will soon be reduced to a pile of anonymous ingots and a few useful parts. After engines, instruments, and landing gear have been removed, the remains are blowtorched into pieces small enough to fit in a furnace.

The last remnant of a once-mighty bomber disappears into the flaming jaws of an oil-fed melting furnace, where temperatures up to 1,500° F. will quickly convert it to a molten alloy.

End of the line. Freshly cast ingots, stacked in neat piles, await their reincarnation as instruments of peace. In the background, the molten alloy is being poured into the molds.

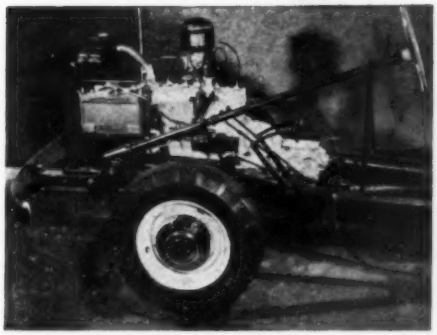
New Pans from Old Planes

IN MANY an American home, the morning's breakfast eggs are frying on the wing of a bomber that once dropped different "eggs" over Germany and Japan.

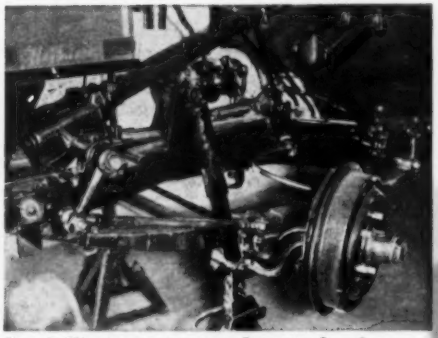
At the North Island Naval Air Station, San Diego, Calif., obsolete and battered warplanes are being melted down. Most of them will end up as such peacetime utensils as pots, pans, and skillets. More than 2,000 planes, from fleet-winged fighters to lumbering Coronado flying boats, have already passed through the furnace, and others are joining them at the rate of 800 a year.

Stripped of all usable parts, the carcasses are cut apart, melted, and cast into ingots. These 15-pound bars of aluminum alloy are then sold to the highest bidders for an average price of about 8½ cents a pound.

For driving comfort, the seat adjusts to different positions.



Placing the engine forward gives limousine seating capacity on a wheelbase of only 124".



Semi-elliptic springs and a rigid axle were restored at the insistence of owner-drivers.

New Shorter Taxicab Scraps Knee Action

BECAUSE taxi drivers have long complained that knee action is costly to keep in service, the Checker Cab Manufacturing Corporation has gone back to a rigid front axle and two semi-elliptic springs in a short-wheelbase model it's producing this year.

By locating the six-cylinder Continental engine over the axle, the manufacturer conserved enough space to shorten the wheelbase to 124", about 17" less than many taxicabs, and yet retain a body large enough to accommodate five passengers, three on the rear seat and two on auxiliaries. The overall length is 206".

Safety features include a buzzer that sounds when the vehicle is backing, crash pads, finger shields on the doors, and a light that glows if any door is open.

Corner Windows Allow Truckers to Look Back

REAR quarter windows in the de luxe and custom cabs of 1948 Dodge trucks allow drivers to back into alleys or up to loading docks with greater ease. They don't have to crane their necks out the door to look behind them.

Another point of interest is the "Air-O-Ride" seat. In this, cushioning is provided by air as well as coil springs, the seat cover being airtight except for an adjustable valve (extreme right). The valve openings may be varied in size for a soft or hard ride.

Detective X-Ray Billings could pry secrets from everything but his car.

Gus and the Private-Eye Caper

By Martin Bunn

THE late-afternoon highway traffic was heavy. Gus Wilson came to a stop behind the middle-aged convertible that headed the outside lane of cars waiting for the light to turn green.

Sitting idle for a moment, he noticed that the driver of the convertible, a fat man with a red face and a redder neck, was staring fixedly at the car alongside his in the inside lane—a cream-colored roadster that featured white-sidewall tires and plenty of gleaming chromium. He also noticed that the swarthy, hatless occupant of the roadster was watching the fat man out of the corners of his eyes. Thin lips beneath his eyebrow-narrow black mustache were twisted in a curious smile.

As the signal winked from red to green, the roadster shot ahead. The convertible stood still. Half way across the intersection the roadster's driver looked back. From

between scornfully protruded lips he ejected a loud and contemptuous "Phooey!"

Impatient horns honked, but the convertible didn't move. Its driver pushed his dusty derby farther back on his head and stamped on the starter button. After half a minute of resultless effort he turned around and yelled to Gus: "Hey, mister—I'm stalled. Gimme a push, willya? Make it a fast one—she won't take aholt 'til she's up over twenty."

Gus nodded and eased his front bumper against the convertible's rear one. With an eye on the speedometer, he began to push. When the indicator climbed to 22 he felt the convertible pull away. It swerved into the inside lane and when Gus came abreast the fat man shouted: "Thanks, mister. My darned ole motor stalls 'most every time I have to stop at a light, and I gotta ketch that roadster that was alongside me."

STANDING in his shop doorway, Gus was enjoying a between-jobs pipe and breath of air when a convertible with its top down swerved off the street, shot up the Model Garage driveway, and braked to a spine-snapping stop. The engine continued to roar.

The derby-hatted fat man whom Gus had

Nick produced a roll of bills and peeled off a ten-spot. "O.K. So it wasn't the carburetor," he said.

assisted a week earlier climbed out. "You Gus Wilson?"

"That's me," Gus conceded.

The fat man fished a card from a pocket of his rumpled coat. Gus read:

XAVIER RAYMOND BILLINGS
Investigations
Confidential—Comprehensive—Conclusive

"That's *me*," said the stout detective. "Call me X-Ray. Everyone in the investigative game does—from my name and because I always see through things. Say, you look sorta familiar. Wait a minute—I never forget a name or anything else . . . You're the feller gave me a push at that traffic light the other day."

Gus grinned. "Catch up with that fancy roadster?"

X-Ray shook his head glumly. "The feller who was drivin' it is a private eye, too. Right now we happen to be workin' on the same caper—that's what we call a case in the profession—only for the opposin' parties. He's one of them know-it-alls, and ever since I been having trouble with my car he's been kiddin' the pants offa me."

"What's the matter with your car?"

"You saw what's the matter with it, up there at the crossroads," X-Ray grumbled. "I can't hardly ever get the motor started without someone giving me a push, and then it stalls every time I let it idle. It'd be stalled now, only I left the throttle out . . . Take a look at it."

"Drive it into the shop."

X-Ray buck-jumped the convertible through the doorway and got out, leaving the engine racing.

"How long have you been having trouble?" Gus asked.

"Well," X-Ray admitted, pushing his derby even farther back, and scratching his head, "she's been sorta hard to start, and apt to stall on me, for quite a spell. But it's only the last couple of weeks that she's been actin' up real bad."

"Have you done anything about it?"

"Sure I have! When she began stallin' all over the place, I figured it was the spark plugs, so I checked 'em. It looked like they'd burned until there was twice as much gap as there ought to be, so I cleaned and adjusted 'em."

"What happened?" Gus queried.

X-Ray shook his head sorrowfully. "I did that job the night before you helped me get started at the traffic light," he said. "You saw what happened . . . Well, there's a feller boards with the wife and me—I ain't mentionin' any names, you understand—who thinks he knows a lot about cars. Ever since I been having trouble he's been saying there's something wrong with my carburetor, and I've been telling him he's nuts. The day after you helped me out he borrows the service manual for my model, and brings it home with him. It says that my carburetor has a low-speed jet and a low-speed air-admission system with some very small passages in it, and that any little particle of dirt in those passages will mess up the way the motor idles."

"Well, that makes me wonder if maybe he could be right, so we take the carburetor apart and clean it. When we put it back, the motor is worse than ever.

"I tell this feller that he's nuts, but he still claims that the carburetor must be clogged—only we didn't know enough to find it. Finally he talks me into taking it to a carburetor specialist. After two days it comes back lookin' all clean and pretty. But when we get it on the car, what happens? The motor won't start! And when I get it started on a fast push, it dies as soon as I try to make it idle. My friend still says it's carburetor trouble, and I claim it's something else—only I don't know what. By that time we're both sore, and we put a ten-buck bet on it. Then a neighbor who's been kibitzing on the job says I'd better bring the car over to you . . . Find out what's the matter with her."

"O.K.," Gus agreed placidly. He got into the convertible and pushed the throttle knob in slowly. As he cut the engine down, it coughed and quit.

Gus got out, raised the hood, and snapped off the distributor head. He removed the rotor, and after a brief inspection looked up at X-Ray. "You win," he told him. "It isn't the carburetor."

X-Ray slapped a massive thigh. "Ten bucks! That'll learn him!" His face clouded. "Hey, mister—can you *prove* it?"

"Sure. Just take a look at this—"

"Hold everything!" X-Ray yelled. "Where's your 'phone? He'll never pay me that ten bucks unless he *sees* you prove it!"

Following the direction of Gus's nod, the fat man lumbered into the office. "He'll be here in a few minutes," he reported when he got back.

Gus grunted, went over to the convert-

ible, and started doing something to its distributor. Just as he finished a man wearing a polo coat and no hat came into the shop. Gus was surprised to recognize the driver of the flashy roadster who had been so contemptuous of the stalled X-Ray.

"Nick Butler—he's in the investigative game, too," X-Ray introduced. "Go ahead—prove it wasn't the carburetor."

"All right," Gus agreed. He cranked the engine over slowly until the breaker arm rested on the lobe of the cam. With a feeler gauge and point wrench he set the points at the correct .018" gap. Then he replaced the rotor and distributor cap, got into the car, and merely touched the starter button. The engine took off instantly. When he throttled it down it idled smoothly.

Nick produced a roll of bills and peeled off a ten-spot. "O.K.," he said. "So it wasn't the carburetor. But it couldn't have been the distributor, either—there was a good spark once the engine got running."

Gus again took the cap off the distributor, and removed the rotor. "Take a look at that," he said. "Only the lobes of the cam are shiny—its flats are dull and dark. That showed me that the fiber block on the breaker arm—I just replaced it—had worn so much that the points barely opened when the cam turned. If X-Ray had put a touch of petroleum jelly on the cam, and checked his point gap once in a while, he would have saved himself a lot of grief—and if the two of you had checked the ignition system instead of having the carburetor overhauled because the trouble *seemed* to be in it, X-Ray would have saved himself money. The condition got worse until, at low speeds, the cam didn't lift the arm enough to break the points apart cleanly and get a spark. Then the engine wouldn't start or idle. At high speeds, though, the cam flicked the arm fast enough to give it momentum that threw it clear."

Nick nodded. "You did a nice job of detecting for a pair of dumb dicks," he said. Then he turned to X-Ray. "Subject X is going to meet Subject Z tonight," he said. "You tail him, will you?"

"I can't," X-Ray growled. "I gotta take the wife to the movies. You do it."

"I got tickets for the fights, down in the city," Nick objected. "You can go to the movies any night."

"Match you for it," X-Ray said.

Nick lost, and went out scowling.

"I thought you fellows were working for opposing parties," Gus said.

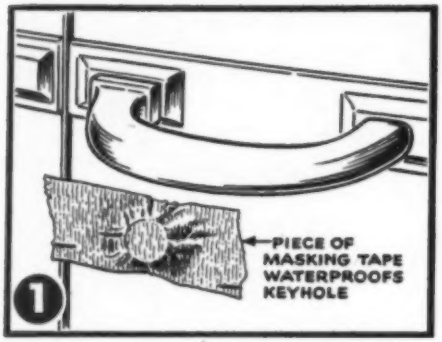
X-Ray grinned. "We are," he admitted. "But if both parties get the info they're paying for, what difference does it make who gets it? I figure that cooperation gets a man further than competition—live and let live, that's my motter!" END

Trouble Pays—Sometimes

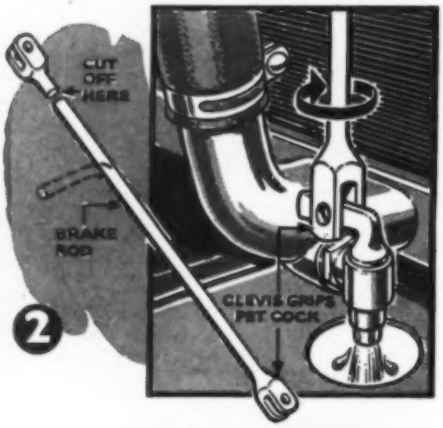
Had any interesting breakdowns lately? Gus wants to hear about your tough and tantalizing car ailments. Write him (on a government postcard) about the false diagnoses as well as the cures. PS will pay $5 to $15 for usable ideas, but cards cannot be acknowledged or returned. Address: Martin Bunn, POPULAR SCIENCE, 353 Fourth Ave., New York 10, N. Y.

"I thought you were working for opposing parties." X-Ray grinned. "We are."

Hints from the



1. Avoid Freeze-ups. A roll of masking tape has been a valuable item this winter in the Model Garage. Before a car is washed, pieces of tape are placed over the door and trunk locks. Even though some of the cars were taken out at once into below-zero weather, there hasn't been one complaint of frozen locks.

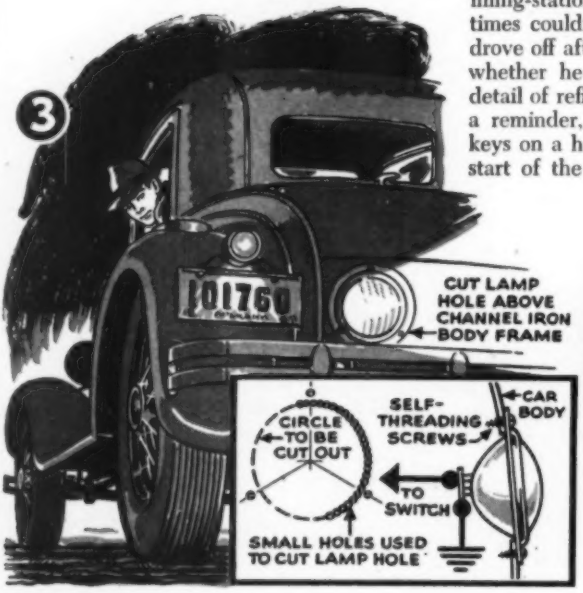


2. Tool Reaches Drain Cock. An old brake rod may be turned into a handy tool for reaching drain cocks that are difficult to get at. Simply hacksaw off one end and bend to form a handle.

3. It's a Back-up Light Now. Francis Hewens, of Boonton, N. J., reports he's using a sealed-beam headlight with one filament gone as a back-up light on a car he has. A hole slightly smaller than the rim was cut by drilling overlapping holes. One wire was run from the live filament to a switch on the dash, the other to ground.

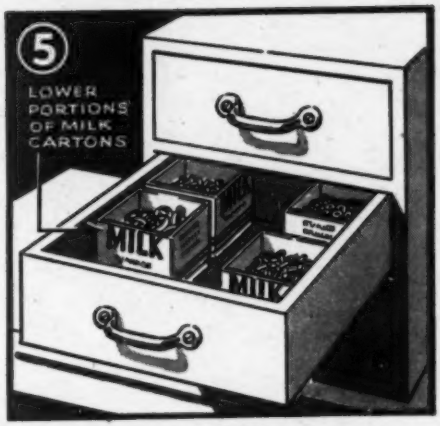
4. You Can't Forget the Oil. One filling-station attendant found that he sometimes couldn't remember, when a customer drove off after an oil change and grease job, whether he had overlooked the important detail of refilling the drained crankcase. As a reminder, he now always hangs the car keys on a hook on the filled measure at the start of the job. Simple, but effective.

Drawings by Stewart Rouse



Model Garage

5. Parts Kept in Order. When J. C. Branstetter, of San Francisco, begins any extensive car repair, he always carries to the job several boxes made by cutting the tops from milk cartons. As he removes bolts and fittings, he keeps each group separate and drops a piece of paper in the container listing where the parts came from.

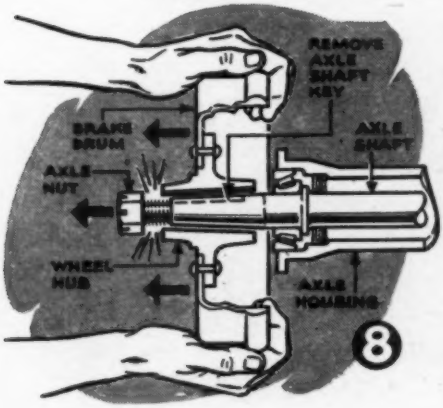


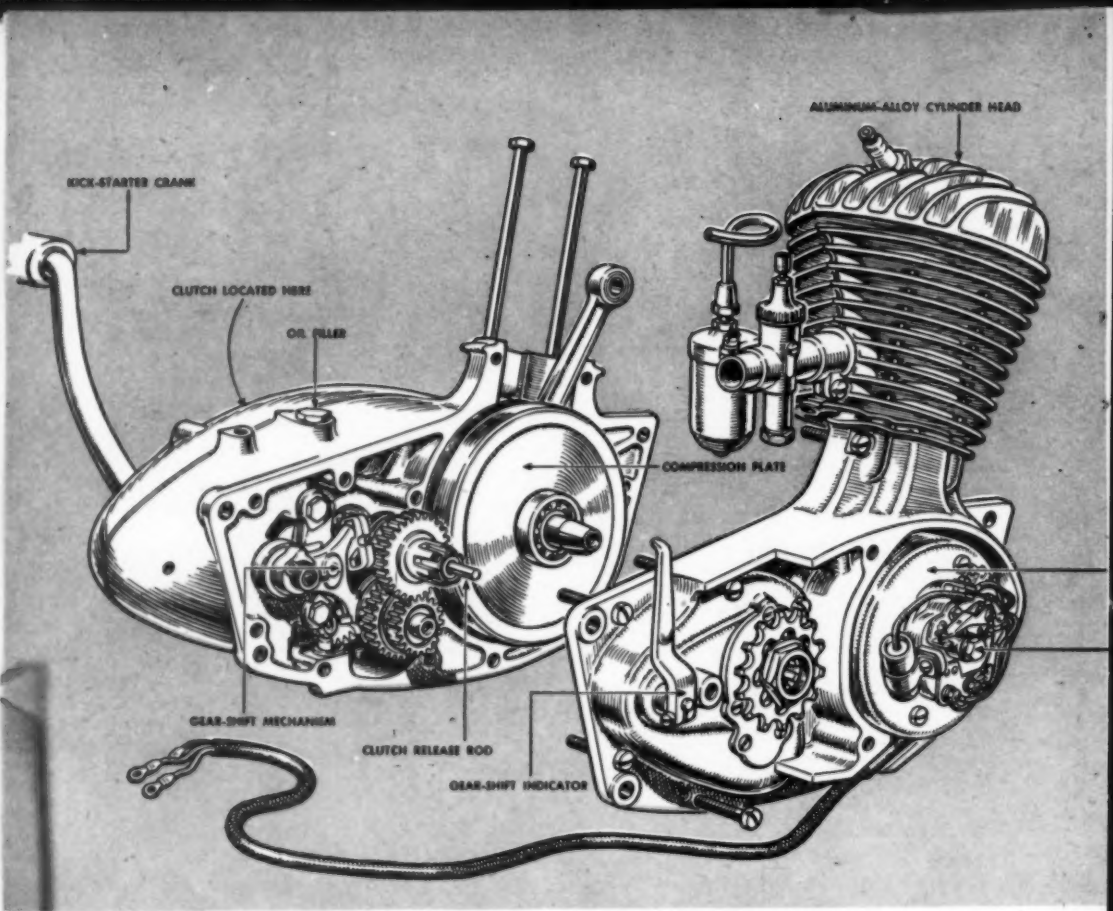
6. Cotter Pin Holds Bead. In some cars, a chrome bead finishes off the joint where the fenders meet the body. In time the fabric that ties it to the joint may rot, allowing the bead to spring out. One or more large cotter pins, slid over the bead, pressed into the joint, and then opened out, will keep it in place.

7. Clean the Trunk Gutter. It's a good idea to clean the gutter around your trunk compartment regularly. If dirt is allowed to accumulate, rain water may seep in even though the lid fits well.

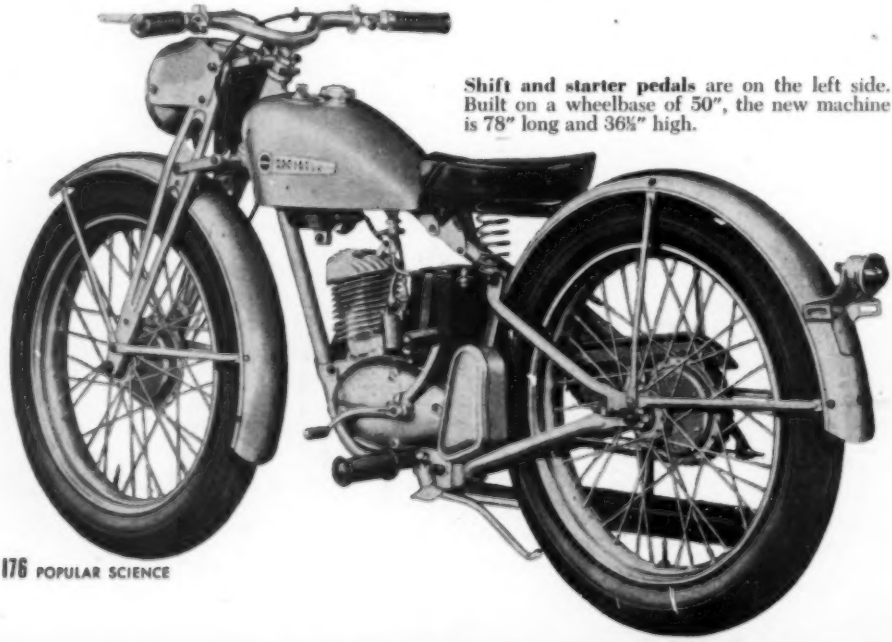
8. Brake Drum Pulls Axle. Carl Vogel, of Chicago, points out that the brake drum may be used to pull the rear axle on Chrysler-made cars. After removing the wheel, drum, and shaft key, replace the drum and turn up the axle nut four or five turns. Then rap the drum against the nut several times and the axle will come out.

Gus Wilson



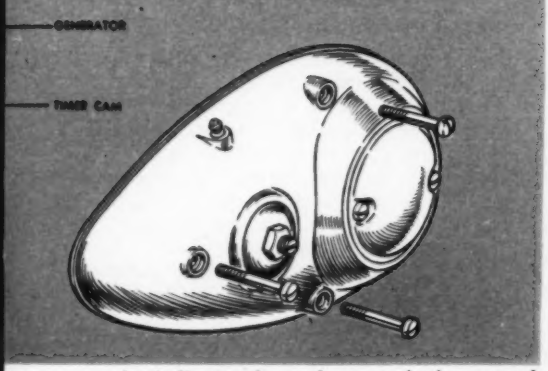


A plate set into the flywheel reduces crankcase volume and increases the compression ratio.



Shift and starter pedals are on the left side. Built on a wheelbase of 50", the new machine is 78" long and 36½" high.

Two-Cycle Harley Shifts by Foot



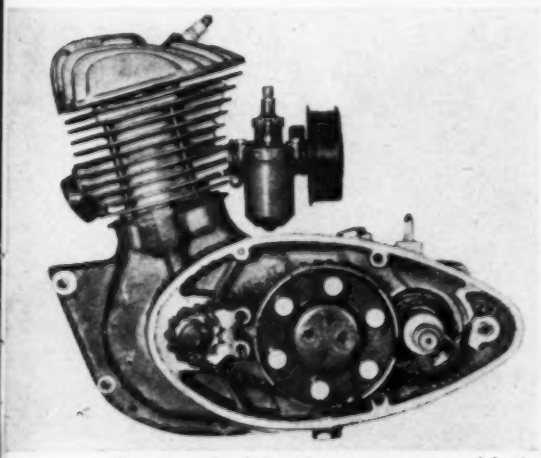
An indicator shows the gear that's engaged.

SOMETHING new in American motorcycles has just appeared—a two-cycle, one-cylinder Harley-Davidson with such features as a foot shift, handlebar clutch control, and foot-rest bar. Designated as the Harley 125 because piston displacement is 125 cc. (7.6 cu. in.), it weighs 170 lb. and sells at the factory for $295 plus taxes.

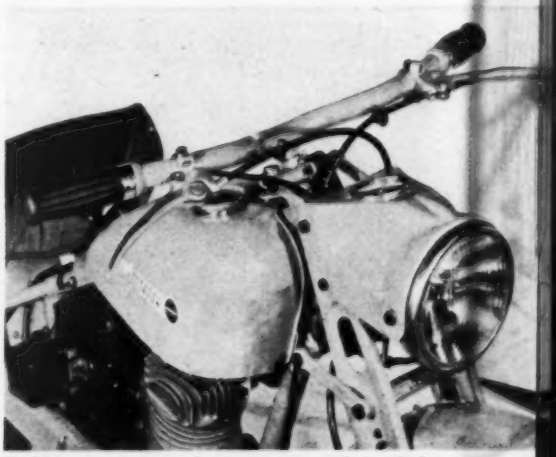
Developing about 3 hp., the two-cycle engine has a compression ratio of 6.6 to 1 and an aluminum-alloy piston with dome head. Burned gases are removed by loop scavenging. In this system, incoming gases enter the cylinder by two ports placed tangentially, travel upward in a loop, and drive the burned gases out of the exhaust port. The engine is lubricated by adding 6 oz. of oil to each gallon of gasoline.

A transmission of the constant-mesh type provides three forward speeds. Operated by the clutch control on the left handlebar, a lever and worm inside the housing on the right side of the engine impart a transverse action to a clutch release rod that runs right through the main transmission shaft, disengaging the clutch. Shift action is transmitted through a shaft to a pawl. Since the shift mechanism is spring loaded, it returns to a central position. The clutch is the wet disk type with cork inserts.

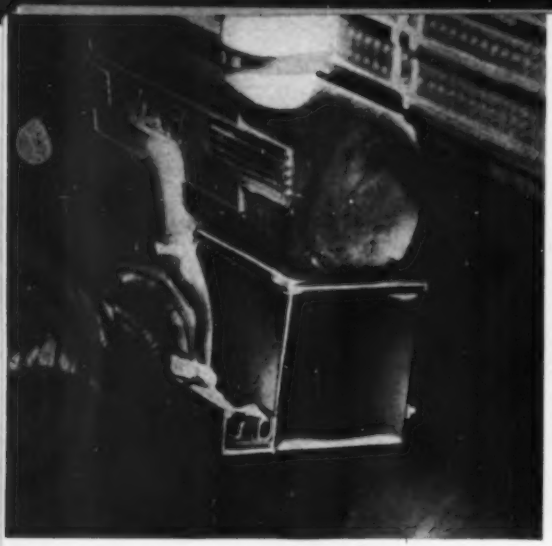
The generator is attached directly to the crankshaft, and a cam on the end of the generator shaft drives the timer assembly. The battery is rated at 10 ampere hours.



Parts on the left side operate in an oil bath. Shown above are the chain drive to the clutch sprocket, starter sector gear, and the spring that returns the shift mechanism to position.



Rubber springs at the upper part of the fork absorb road shock. Clutch, front brake, and throttle are operated by handlebar controls. Standard finish will be black with chrome trim.



Cigarettes Lighted for You

HERE's a gadget that delivers lighted cigarettes to you while you drive. You need only reach over and pull out a small drawer in the lower section of a storage case mounted under the instrument panel. As you pull out the drawer, a cigarette drops into place and is pressed against a self-operated, fast-acting lighting element.

Measuring 2½" by 2¾" by 3⅜", the case is made of steel finished in chrome. It will hold 20 cigarettes of standard size. The retail price is about $5.

Control Feeds the Gas

ON LEVEL roads this control enables you to set the accelerator pedal for any desired speed—and then forget it. It consists of a ratchet and pawl that hold the pedal at the point of farthest depression until released by moving the foot to the left, the ratchet being mounted on a spring-operated hinge. If the brake is applied, the pedal also is released automatically by a safety cord. The device is a product of Automatic Accelerator Control, Inc., of Monroe, Mich., which has given it extensive tests.

Surplus Plane Tank Converted into Small Racer

ALUMINUM jettison tanks obtained from war surplus are used for the bodies of small racers that the E. K. Cargill Company, of Macon, Ga., plans to put on the market.

The racer is powered by a two-cylinder air cooled opposed engine that gives a speed of 50 m.p.h. and does 75 miles on a gallon of gasoline. The chassis, differential, and transmission are of Austin manufacture, the fenders come from motor scooters, and aircraft wheels and seat are used. There's a large storage space behind the seat.

Mechanics and Handicraft

REG. U. S. PAT. OFF.

Remote-Reading Weather Vane PAGE 180

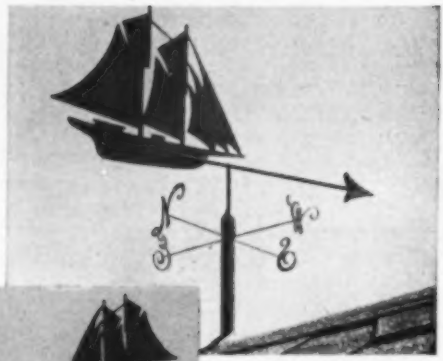
Storybook Birdhouse PAGE 184

I'm an All-Thumbs Craftsman PAGE 194

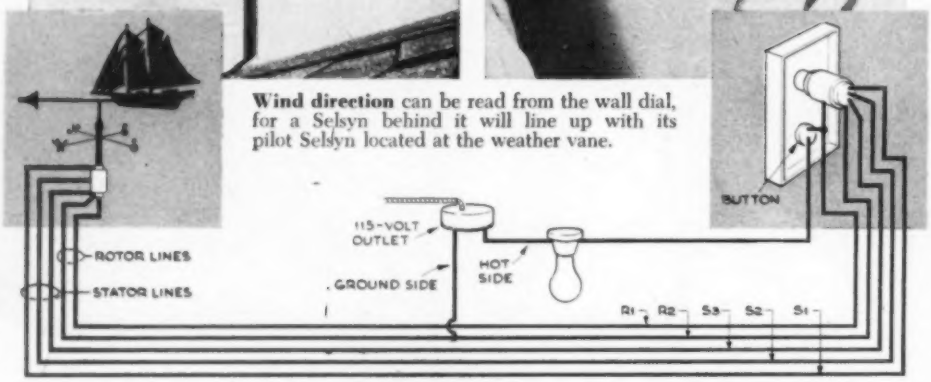
Master Your 35-mm. Camera PAGE 216

Hearing Aid Gets Broadcasts PAGE 220

Electrified weather vane signals wind direction on indoor dial. See page 180.



Wind direction can be read from the wall dial, for a Selsyn behind it will line up with its pilot Selsyn located at the weather vane.

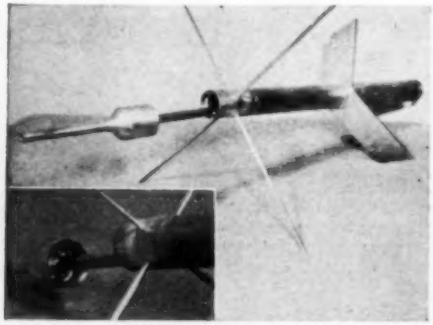


Weather Vane Shows Wind on Indoor Dial

By Karl Greif

WOULD you like to stay snugly inside your home and see at a glance from what direction the wind is blowing—at any time, day or night? This remote-reading weather vane will enable you to accomplish just that. At the touch of a button on a dial on your living-room wall, a pointer will report the wind direction outside.

Cut the ship and compass letters from sheet aluminum. Most other parts are made from brass.



Ball bearings are fitted into the ends of the upright. A brass cover protects the upper one.

Two Selsyn Ⓣ* motors will do the job. When several of these war-born gadgets are properly wired in the same circuit, rotating the shaft of one will cause the shafts of the others to turn in exactly the same degree. Hence, if a pilot Selsyn is rotated by a vane atop the house, momentary application of current by means of a push button will line up a follower that operates an indoor indicator. This reading will then remain until the button is pushed again, enabling you to see whether wind direction has changed since the last reading.

Selsyns that will do the job are available as surplus for about $3. Since only low torque is required, 400-cycle types will serve on 60-cycle lines if an appropriate ballast is used. However, avoid the type that can go 180 deg. out of phase.

Using metal-cutting blades, jigsaw the letters and ship from 1/16″ to ⅛″ sheet aluminum. Instead of scribing the metal, attach a full-size paper drawing to it temporarily with rubber cement. Make the first cuts with a 20-tooth heavy-duty blade, finish the outline with a regular 20-tooth blade, and cut out the interior with the latter blade and a small 32-toother, using the slowest speed.

An 18″ length of 1″ brass pipe with a 1 5/16″ outside diameter provides vertical support for the vane. Ball bearings in each end carry a 13/32″ rod that couples the vane to a Selsyn in the attic below. After facing the pipe, bore it out until the bearings are a push fit. Any good 30-mm. bearings can be used.

For the roof mount, cut an oval 1 15/16″ wide and 1½″ long in the center of a 2″ by 10″ rectangle of ⅛″ brass, and drill four No. 11 mounting holes at the corner. Then bend the piece to conform with the roof pitch, slide it down over the brass pipe to about 8″ from the bottom, and solder the joint.

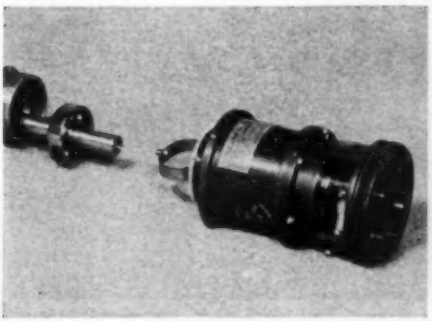
Holding the pipe and bracket assembly as it will appear on the house, determine the direction of north with a compass, and scribe a vertical line on the pipe.

Measure 1½″ from the top of the pipe, drill and tap an 8-32 hole on the scribed north line, and repeat every 90 deg. for the other points of the compass. About 1″ from the bottom of the pipe, drill and tap another 8-32 hole and insert a ¼″ roundhead screw. This will allow the lower bearing to be oiled. Cut four 8″ lengths of 5/32″ rod, thread all the ends, turn into the four support holes in the pipe, and solder. Then screw the letters on the ends of the rods.

From a piece of 1½″ brass rod, turn down a flared upper bearing cover to the dimensions in the drawing, and drill to suit the shaft. Bend a 1″ wide strip of .010″ brass shim stock to serve as a weather skirt around the shoulder and solder well. Then slip the completed cover down over the end of the pipe and solder to the shaft, filing away excess solder to fair the covering into the rod. In the top of the shaft, file a concave groove to a 3/16″ radius, drill and tap a 10-32 hole ½″ deep, and drill and tap a 6-32 hole ½″ deep into the bottom end of the shaft.

A 20″ length of ⅜″ aluminum tubing serves as the vane crossarm. Slot one end to receive the ship as indicated in the drawing. With the ship in the slot, drill two No. 29 holes to clear roundhead 6-32 screws. Also drill a clearance hole for mounting the

*Registered by General Electric.



Brass shim stock bent to an elliptical shape couples the vane shaft and the pilot Selsyn.

An arrowhead is molded by pouring molten lead into a form jigsawed in a block of ¾″ wood.

shaft, and mount it loosely with a roundhead brass 10-32 screw.

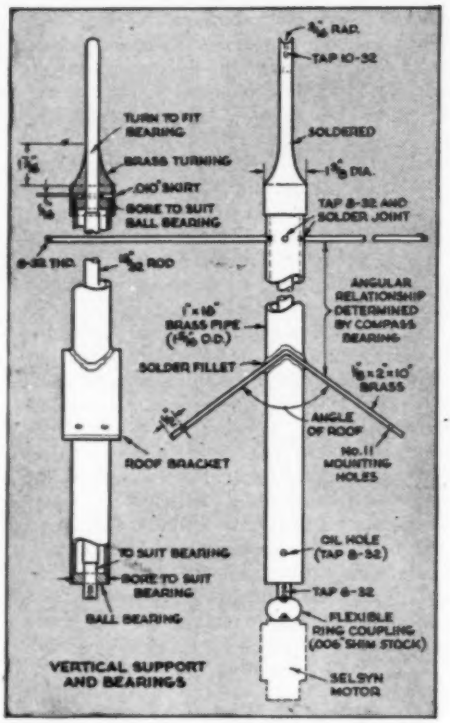
Now clamp the brass pipe vertically in a vise and hang strips of sheet lead over the pointer end of the crossarm until the weight counterbalances the ship. Add another ½ lb. to this lead and put it all in a ladle.

Transfer the arrow pattern to a piece of ¾" scrap wood, jigsaw it out, and nail wood over the bottom. This will serve as a mold. Elevate the end slightly so the point of the arrow will be thinner than the base. Heat the ladle with a blowtorch, and pour the lead into the mold.

Drill a ¾" hole 1" deep in the completed arrow to receive the crossarm. With the assembly clamped in the vise, slide the head back and forth until the arm balances. Then drill and tap the head for a 6-32 brass locking screw.

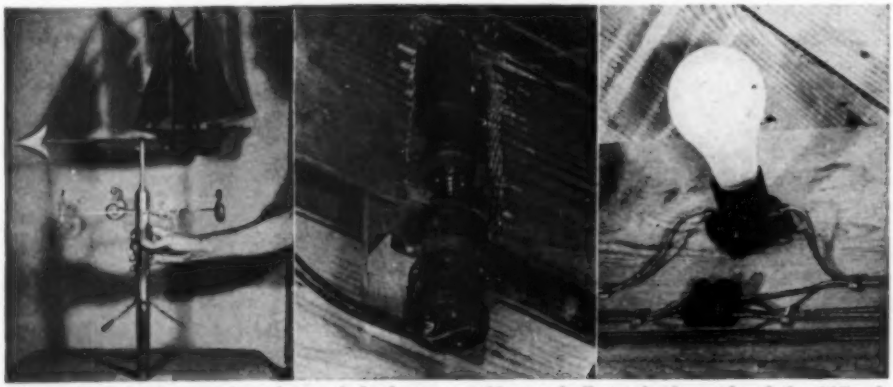
After painting the assembly, cut out a small circle of roofing at the point where the vane is to be located and bore a 1 5/16" hole. Put the pipe down through, coat with roofing cement or tar, seat the bracket, and screw it down.

A flexible coupling for the shaft and Selsyn may be made by bending a ¼" by 3" strip of .006" brass shim stock to elliptical shape. Drill a hole in each end and in the center. Put a roundhead screw through the center hole into the bottom of the shaft. A nut holds the ends together on the threaded Selsyn shaft. Secure the brass pipe and Selsyn to a stepped wood mount with pipe straps and a metal strap as seen in the center photo below. Put a dab of paint on

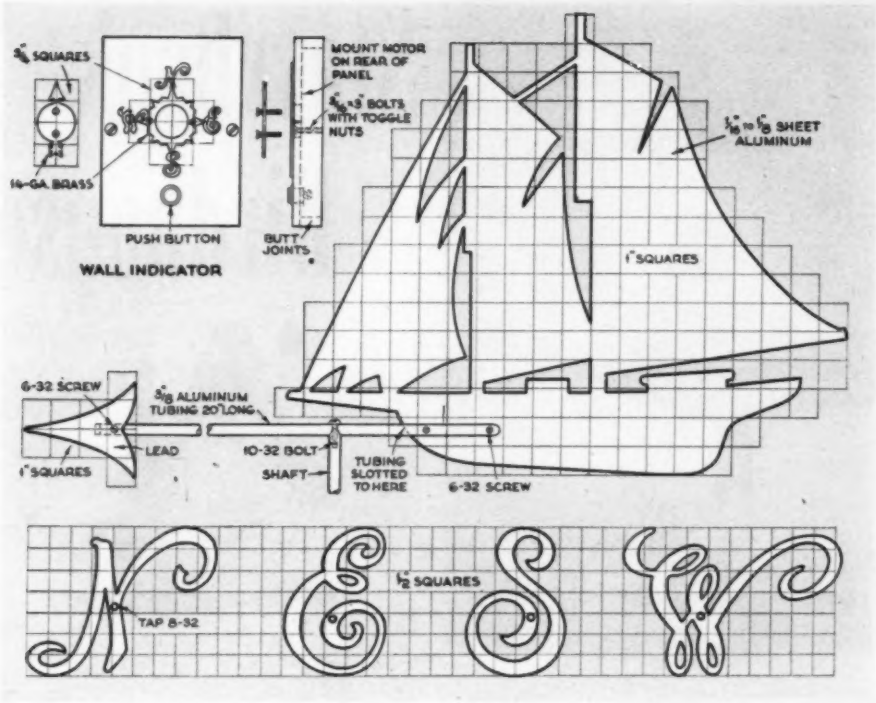


the end of the shaft and coupling so the vane will not have to be reoriented when taken apart for oiling.

Cut the pointer and compass rose for the wall indicator from 14-ga. brass. Letters for the rose may be copied exact size from the drawing. Drill and countersink for flat-



When the vane is complete, bore a hole down through the roof and mount the pipe and pilot Selsyn on stepped wood blocks underneath. Put a 60-watt bulb in the hot side of the 115-volt power circuit as ballast and lead the ground to one side of the rotor terminal block as above.



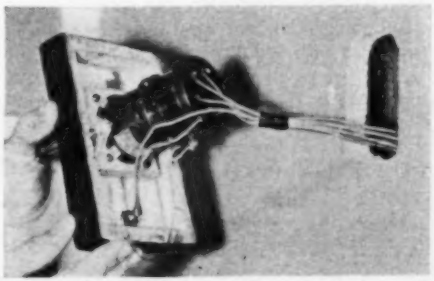
head brass screws, buff to a high luster, and coat immediately with clear lacquer to prevent tarnishing.

The plaque itself is simply a shallow box with the Selsyn follower mounted on the back with four clips. The box must be deep enough so that the remaining length of the Selsyn can be accommodated in the wall. Mount a doorbell button in a ⅜" hole bored in the face of the plaque, and cut a clearance hole to pass whatever kind of pointer-shaft coupling is practical for your Selsyn.

Five wires of any convenient size are required to connect the two Selsyns, two for the rotors and three for the stators. The rotors are wired in parallel and draw about .5 amps at 36 volts. A 60-watt bulb in series with the hot side of the 115-volt power line serves as a ballast for the rotors, the lamp being lighted only when the button is pressed to read the wind direction. For safety reasons, the ground side of the house circuit should be connected to the rotor terminal block. The hot side then connects only to the bulb and push button. Solder the wires to the Selsyn contact pins.

To orient the indicator with the vane, have someone stand outside and call the heading of the vane. After loosening the four clips, rotate the entire Selsyn, with the push button depressed, until the pointer reading is the same as that of the vane.

The bearings in the vane unit should be oiled every six months, or oftener if the moisture or salt content of the air is high. To oil the top bearing, remove the screw that holds the flexible coupling to the shaft. Then go up on the roof and pull out the shaft, invert, and apply oil. END



Mount the plaque over a hole cut in the wall after orienting the pointer with the wind vane.

Storybook Birdhouse

Here's a birdhouse that's different, a bit of fantasy right out of the pages of Grimm and Andersen.

By Karl Greif

YOU can give your workshop a rest from square corners and nicely jointed edges with this unusual project, patterned after the illustrations in children's storybooks. It's made mainly of soft pine, which should be fairly free from knots since there is considerable shaping to do.

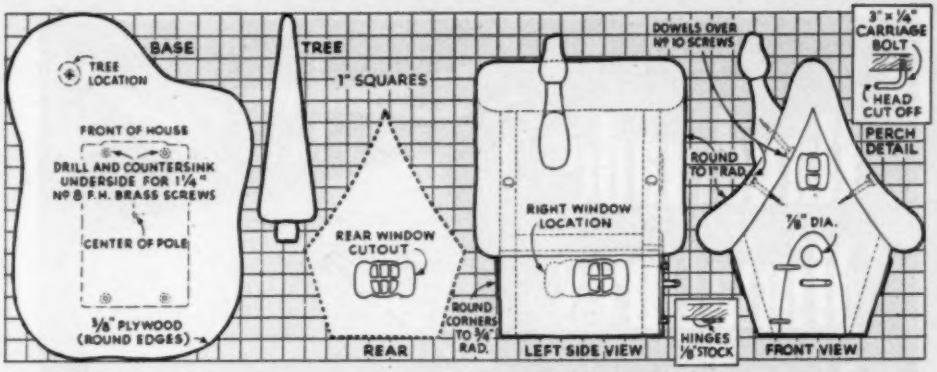
Using the squared drawings, lay out full-size views of the house, roof, windows, and tree. Trace the rear view twice on ¾″ stock (front and back are identical in outline). Sides are also identical and should be cut from 5″ by 6″ pieces. Jigsaw all four walls according to the pattern, and glue and nail them together. Bevel top and bottom edges of the sides to conform with the front-view drawing, and round the four corners to about a ¾″ radius.

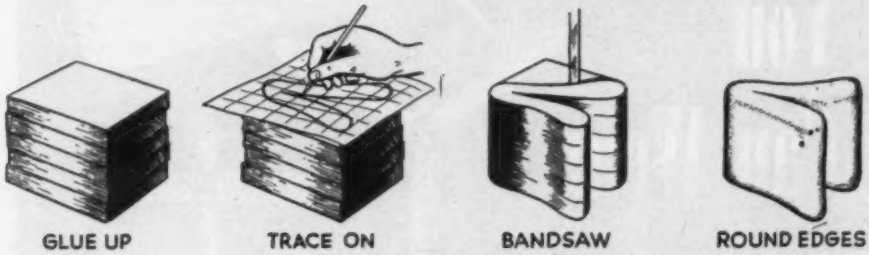
Jigsaw the windows, door, and hinges from ¾″ outdoor plywood or similar stock, cutting openings for the windowpanes and the entrance. The latter, incidentally, should be just large enough to admit the species of bird you expect to take up residence. Glue and tack the plywood pieces in place.

The roof is probably the most distinctive feature of the whole project. It is made by gluing up several pieces of 9″ by 10¾″ stock to a total thickness of 10″. If you have access to a 10″ bandsaw, you can cut them all in a single operation; if not, glue as many as you can manage at one time. After cutting and gluing are completed, round the outlines with knife, rasp, and sander.

On a 1½″ by 1¾″ by 6¼″ block, trace two views of the chimney and jigsaw or carve it to shape. Mount it with glue and a 2″ screw from inside the roof. The roof is also fastened with glue and counterbored screws. A carriage bolt, shaped as shown in the detail, serves as door handle and perch; the tree can be either turned or carved from a 2¾″ by 2¾″ by 10½″ block.

Jigsaw the base from outdoor plywood and round the edges. Sand all surfaces as smooth as possible. Apply two coats of shellac, and three or four of good lacquer or enamel, following the color scheme shown above or improvising any variation that appeals to you

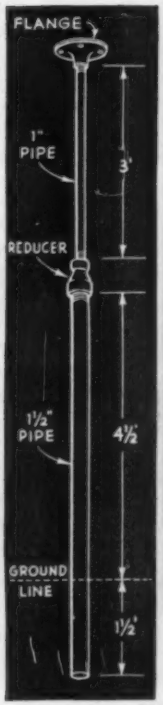


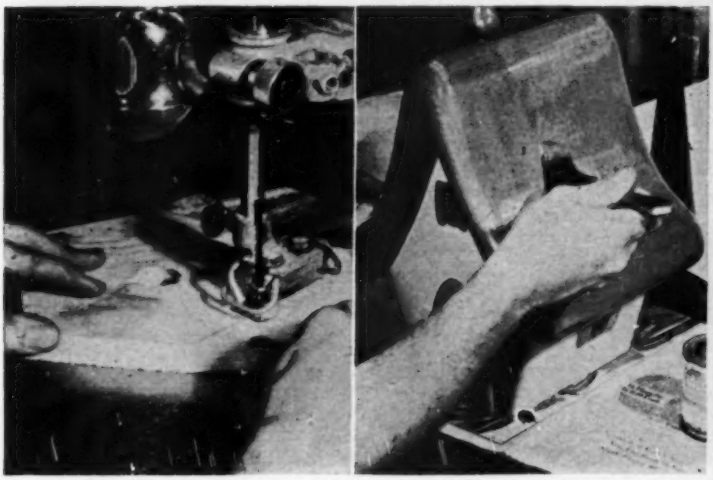


MAKING ROOF

Bolt a pipe flange to the bottom of the base; screw on the house (don't use glue; you may wish to take it off for cleaning), and it is ready for tenants. Unscrew the house and take it in for the winter, and when you do, grease the pipe threads to prevent rusting. A plug in the end of the pipe will keep water out.

Enlarge the outlines of the birdhouse parts onto large sheets of paper and saw and carve the various pieces. It isn't necessary to duplicate all shapes and dimensions exactly so long as the parts fit properly. Paint the house and base separately. Mount the unit on a flanged pipe.

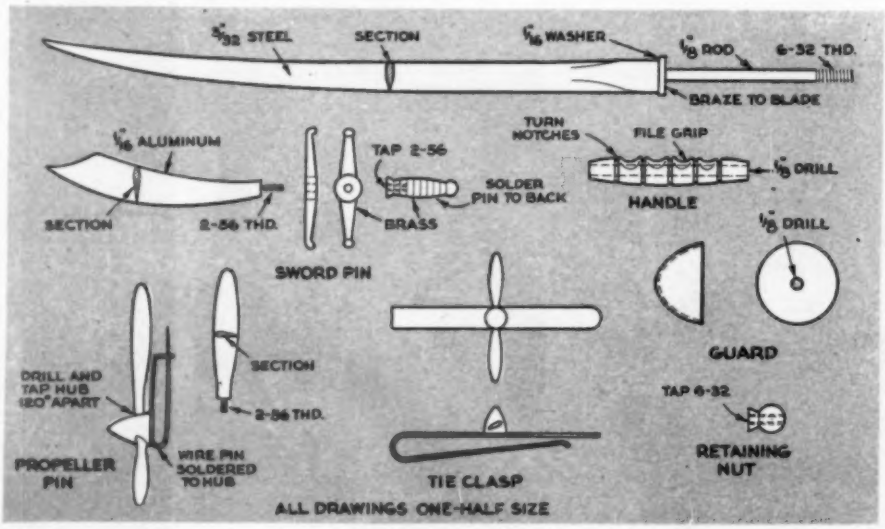




Handmade Miniatures You Can Wear

By John J. Harper

THESE gleaming metal miniatures make perfect gifts for somebody special, because they represent painstaking craftsmanship on your part. The small sword and three-bladed propeller are distinctive lapel pins, but the sword is readily made as a tie clip instead. The steel-bladed letter opener is a striking desk ornament. A metal-turning lathe is convenient for forming the sword handles and prop spinners, but if you are a good



hand with a file you can do without it.

For the sword pin, I used a scrap of 24 SO aluminum for the blade and bits of brass for the handle and guard. Because finish is important on such pieces, use first emery and then crocus cloth to remove all file marks and impart a polish. The pin in back, soldered to the brass, can either be a small safety pin or a shaped and sharpened piece of piano wire.

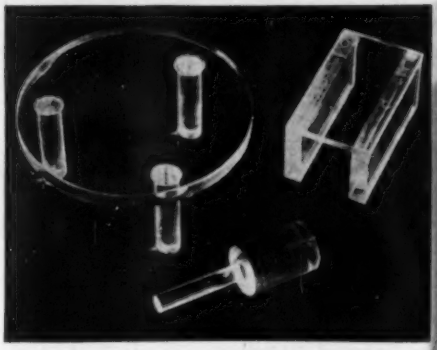
The propeller lapel pin is also easy to make. I filed the blades from 3/32" aluminum, leaving a short round shank at the root of each for threading into the hub. This was turned from stainless steel and drilled and tapped with three holes 120 deg. apart. Like the other pieces, it was buffed to a high luster and then lacquered.

A strip of stainless-steel sheet is the clasp part of the tie pin. The hub was turned from drill rod and drilled with two small holes at 180 deg. to take the stub ends of the brass blades, which are soldered in place.

Though a slightly more difficult piece, the letter opener is well worth the effort. I used a piece of ground flat stock for the blade, hardening it after shaping, but some aluminum alloy 3/32" or ⅛" thick would do almost as well. If you use aluminum, remember to leave a long tang that can be threaded for the handle. The curved guard was spun on the lathe from some soft aluminum tubing, though it might equally well have been filed from brass. After assembling the piece, inspect it carefully for file marks, and then polish, buff, and lacquer it.

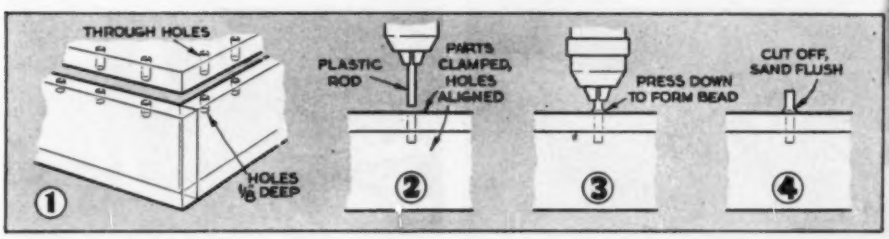
Plastic Pins Make Invisible Welds

A TRICKY method of assembling clear-plastic pieces, using neither cement nor screws, is to hold them together with plastic dowel pins that are fed into predrilled holes while rotating rapidly. The pins are practically invisible since they melt into the adjoining material. The technique is useful for joining rods to flat stock (as in the miniature coffee table shown), for joining pieces of flat stock, and for connecting different diameters of round stock.

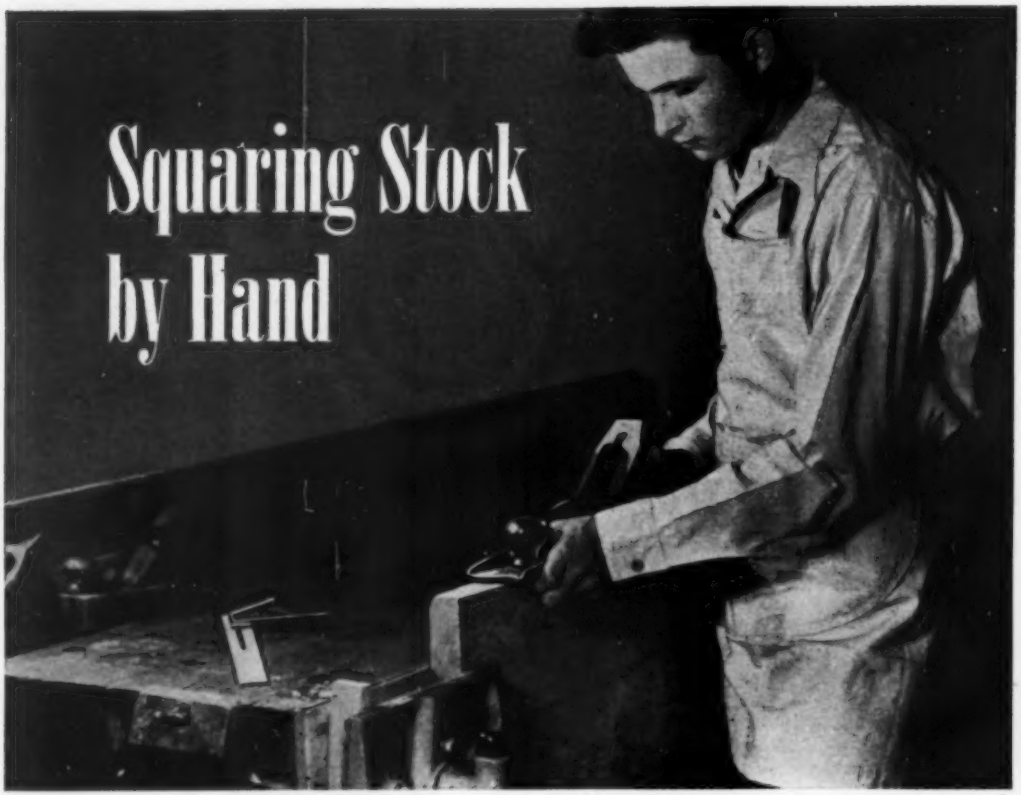


To make an assembly such as that in Fig. 1, lay out and drill holes in the work, which should be clamped to assure perfect alignment. The holes need not penetrate more than ⅛" or 3/16" into the lower pieces. Next chuck a plastic rod in the drill press, of the same diameter as the lead holes or slightly smaller, and adjust the belt to drive the spindle at its maximum speed. With the rod spinning, feed it down into the hole (Fig. 2) until you strike bottom, and continue to feed slowly.

The rod will melt under pressure and friction and the hole will start to fill up. The moment it has completely filled, stop the spindle as quickly as possible and press down lightly until a small bead forms at the surface of the work, as in Fig. 3. Hold the rod there until the plastic hardens (approximately a minute) and then release the rod in the chuck. Repeat the operation on all holes, and then cut off the stubs (Fig. 4), finally sanding, polishing, and buffing the surface.—KENNETH W. JUDGE.



Squaring Stock by Hand



Continuing the series on woodworking methods, this article tells how to get around an edge.

By Edwin M. Love

TRUING and surfacing one or both faces of a board—discussed in two previous articles—is the first step in readying the board for use. But before you can consider the stock as having graduated from the rough to the finished class, you have to square and smooth the ends and edges. Start with one edge; if it is damaged or crooked, place a straightedge far enough in to clear the defects and draw a pencil line along it. Depending upon the amount of waste to be cut away, you can rough to the line in any one of a number of ways.

Saw to the line if possible. If the strip to be removed is too narrow to support a rip saw, use a draw knife as shown in Fig. 1. Work with the grain, take short strokes, and keep one handle a little ahead of the other. Should the blade dig in, rock it back on the bevel slightly to avoid cutting below the

1

2

line. Change the pulling direction to suit the direction of the grain. The edge of the blade may be kept keen by holding one end against a bench stop and whetting the bevel with circular strokes of an oilstone (Fig. 2).

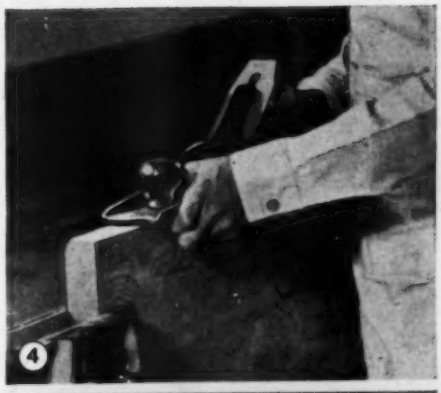
Lacking a draw knife, cut to the line at intervals and pare away the waste with a chisel as shown in Fig. 3. Another useful tool for roughing is the jack plane. As in surfacing, you must avoid dropping the heel of the plane at the beginning of a stroke, or the toe at the end. Lift it clear after each stroke, but instead of gripping the knob with the left hand, hook the thumb around it and guide the plane by sliding the fingers along the face of the board (Fig. 4). Since the jack-plane iron is crowned (Fig. 7), the stroke can be centered on the high part of the board edge.

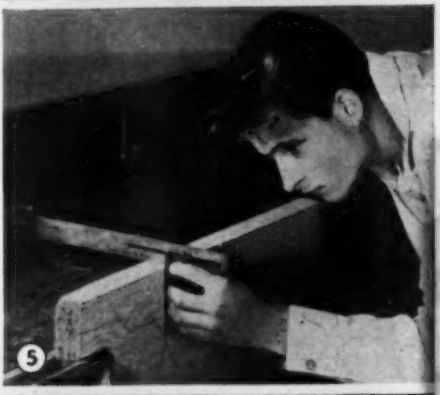
Having roughed to the line with saw, knife, chisel, or jack plane, you are now ready to get down to the fine job of truing. Test the edge with a try square or an adjustable combination square—a much more useful tool—by pressing the handle against the face of the board and looking for light between the edge of the piece and the blade (Fig. 5). If the board is small, hold it at eye level for inspection.

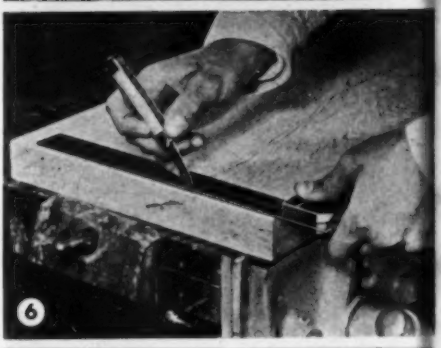
Finish truing the edge with a jointer plane or smooth plane. Its long sole rides high spots that are too far apart for the jack plane to span. Since the edge of the iron is straight rather than crowned, centering it to one side does not correct an edge that is out of square. Instead project one corner of the plane iron toward the high side by moving the lateral-adjustment lever toward the opposite side. Fig. 7 shows how this will cause it to cut a thicker shaving at one side.

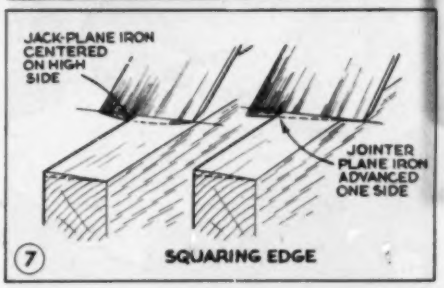
When the wood is cross-grained, a stroke or two of a smooth plane—made full length—is effective in smoothing rough spots. Plane and check with the square until the edge is perfectly true, and then mark this edge so that you can use it as a working base for squaring the ends and taking width measurements.

Lay the square across one face of the

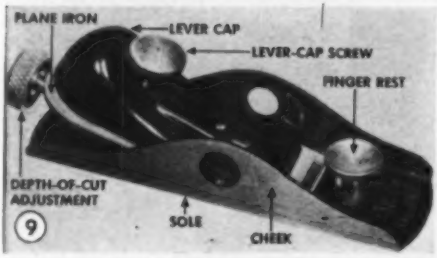




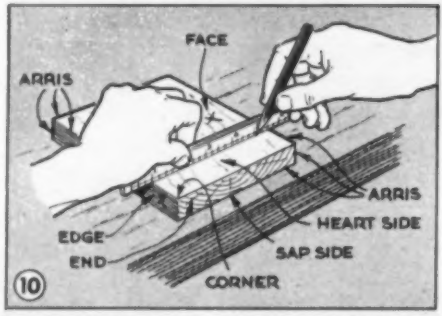




8



9



10

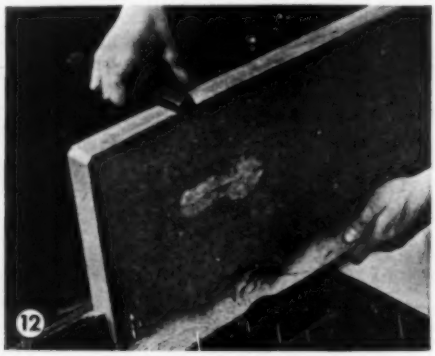
board, as in Fig. 6, so that you can mark off an end exactly at right angles to the squared edge. Draw a line far enough in to clear defects and irregularities. For rough work a heavy pencil line will do, but when accuracy is wanted, a sharp, hard pencil or the point of a knife should be used. Saw off any sizable waste. Smooth the end with a plane held as in jointing (squaring an edge) but at an angle for cleaner cutting. Continuing the stroke of the plane blade beyond the far edge will cause splintering unless the edge has been beveled with a chisel. Both the bevel and the proper method of holding the plane are clearly shown in Fig. 8. If there is not enough width to allow beveling, plane toward the center of the end from both edges. Test for squareness with the face side and the trued edge.

Because of its low-set iron, a block plane (Fig. 9) cuts particularly smoothly on end grain. Depth of cut is regulated as in other planes, but side adjustment is made by loosening the lever cap a little and shifting the iron. Sharpen the iron to a straight edge, dub off the corners to keep them from scratching, and clamp it in the plane with the bevel up.

Some of the more common terms relating to a board are illustrated in Fig. 10, along with a recommended method for taking accurate measurements. The latter consists of holding a rule on edge with the division marks against the wood, and, since the end of the scale may be worn off, it is projected beyond the edge so that the 1″ mark can be used as zero. Use a sharp pencil or knife for marking off measurements.

Several methods are commonly employed for laying out the width of a board. If it is rather wide, measure the finished width at both ends and connect the points with a

11



12

line drawn along a straightedge. Often a combination square can be adjusted to span the board as in Fig. 11. The blade can be adjusted for width, and the square is then drawn along the face of the board in the direction indicated by the arrow, while it guides a pencil or other marking device. If the width is not too great, a marking gauge can be used in the same manner.

The final operation in squaring a board is to bring it to thickness. Set a marking gauge by measuring accurately the projection of the pin on the beam. Hold the gauge as shown in Fig. 12, and, rolling it forward to engage the pin lightly, press the head against the face side. Plane the board to the line. True the surface if both faces are to be exposed. [TO BE CONTINUED]

Draw-filing the edge of a scraper blade. Move the file back and forth, keeping it at right angles with the blade faces. Deburr the sides with the file held flat.

Burnish the edge by laying the blade on a bench and stroking it flat with a piece of round hardened steel. A punch or nail set works well. Oil or wax it lightly.

Turning the edge. First stroke the edge with the burnisher held at right angles; then tilt it in a trifle to form a small cutting burr on each of the faces.

Correctly sharpened, the scraper turns up a shaving on hardwood. On fir, shown here, shavings are cut from the hard grain, but crushing soft grain produces some powder.

Sharpened Scraper Readies Wood for Sanding

Most hard or cross-grained woods are better prepared for sandpapering if they are first scraped to remove plane marks and other rough spots. A simple scraper blade will do the job nicely, and it is one of the easiest tools to condition.

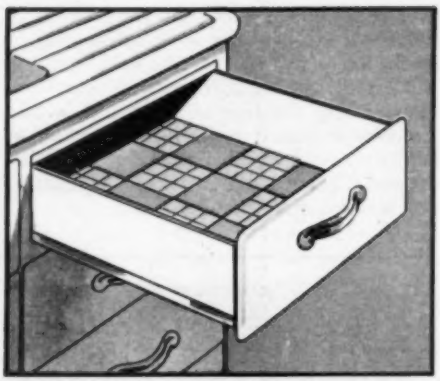
Clamp the blade in a vise and draw-file it with a flat file. Bring all the edges straight and square, and make the arrises sharp. Remove the burr by rubbing the file flat against the sides. Round the corners slightly. Hone the edges with an oilstone held at right angles, and rub off the burr again.

Next lay the blade on the bench and rub the side with a burnisher, which can be any piece of round, hardened steel such as the side of a nail set or punch. Follow this by stroking firmly along an edge with the burnisher held vertical. Gradually decrease the angle to about 85 deg. The slight burr turned toward the face enables the scraper to cut smoothly. Repeat until all eight arrises have been made sharp and turned down very slightly.

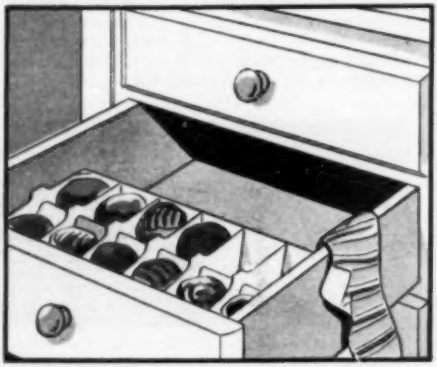
In use, the scraper is inclined until an edge begins to cut. Push or pull it, and keep shifting the stroke on the wood to cover evenly. When the scraper dulls, it can be reburnished two or three times before it becomes necessary to refile the edges. Sometimes a reburnished blade works better than one that is newly filed.

KEEPING THE HOME SHIPSHAPE

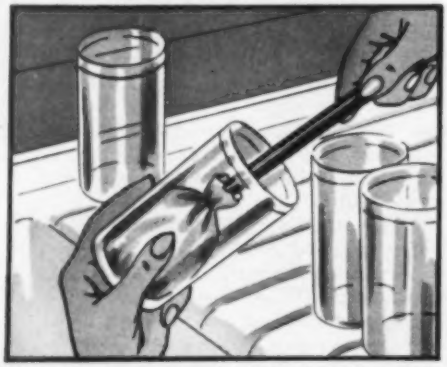
Pictures on records will help a young child who is unable to read to select the one he wants. Illustrations that will suit the titles often may be found in juvenile books.



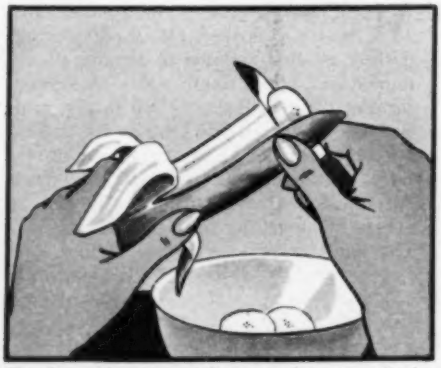
Linoleum fitted into a cutlery drawer deadens the noise of knives and forks being returned to place. Use scraps left over when you next put down a new covering on the kitchen floor.



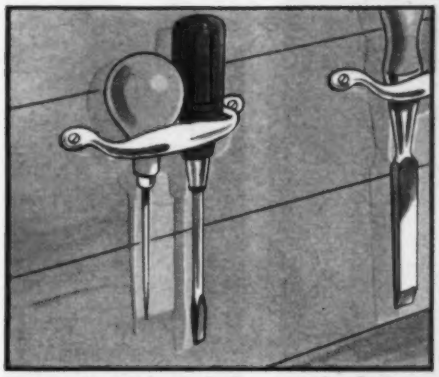
An egg carton in the dresser drawer provides handy compartments for orderly storage of a young child's supply of clean socks. Selection of the desired socks then becomes easier.



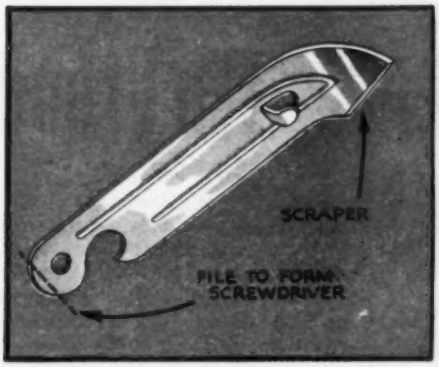
Tall glasses may be dried inside with a dish mop adapted for the purpose. Cut a piece from a torn dish towel, wrap it up around the mop head, and secure with string or a rubber band.



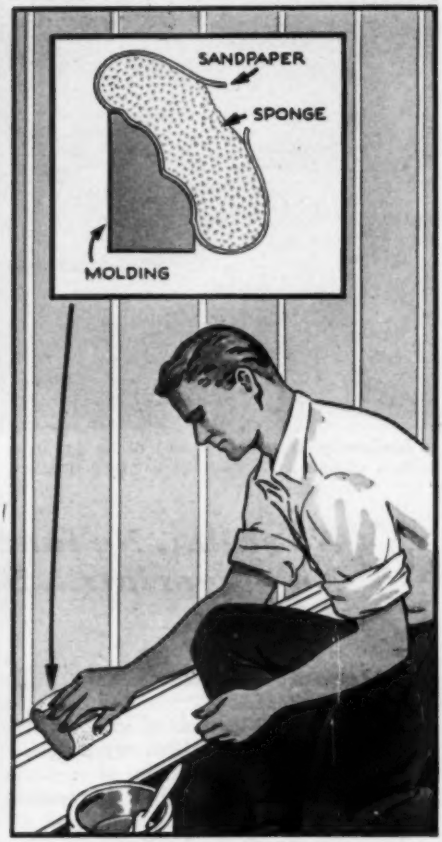
To slice a banana without touching it with the fingers, peel it down all around except for a narrow segment. Then hold the banana as shown and cut against the remaining strip of peel.



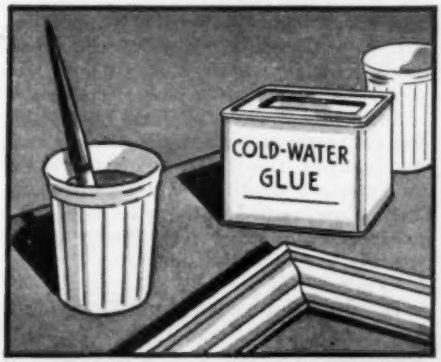
Drawer handles attached in a tool cabinet or over a workbench make excellent tool holders, and they're quickly installed. Several of your smaller tools may be kept in each holder.



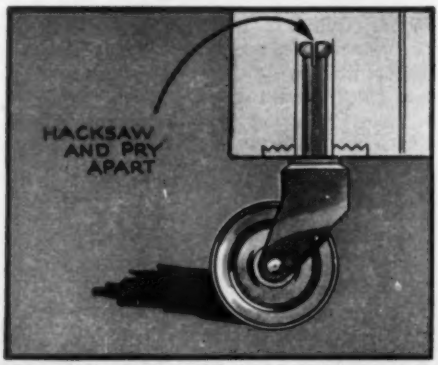
Beer-can openers have many uses. For instance, the point makes a good scraper for cleaning out corners and may be used to apply putty. Filed off, the handle serves as a screwdriver.



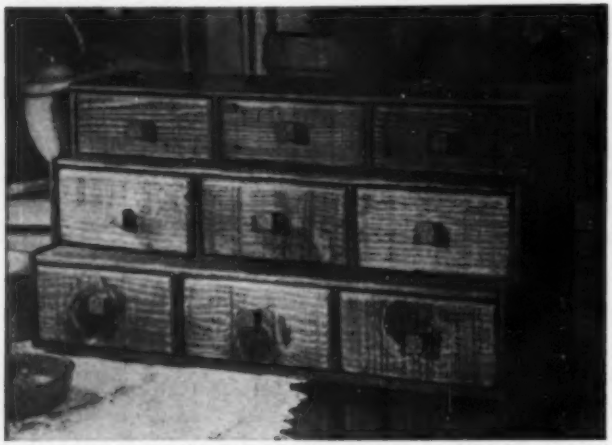
Irregular surfaces may be thoroughly sanded with a sheet of abrasive paper formed around a rubber sponge or piece of sponge rubber. The paper will conform to most moldings.



Paper drinking cups make excellent containers for mixing small amounts of cold-water glue. Inexpensive to buy, the cups can be discarded after use. The 3-oz. size is probably best.



Casters that fall out if a piece of furniture is lifted may be kept in place by this method. Hacksaw a slot about ¼" deep in the end of the caster post and wedge the cut slightly apart.



A horizontal spice box is one of my projects. It was copied from an 18th Century original.

Handsomest of all my pieces is a wall shelf with two drawers. It's one of my latest jobs.

No skill... No fancy tools... No blueprints... BUT... I'm Proud

By Jerome Parker

FROM the little mounds of sawdust and wood shavings that litter my floor has just emerged a reproduction of a nine-drawer 18th Century spice box. It's crude—but I'm proud of it.

The spice box is the latest piece I have completed in a long-term project of making replicas of early American furniture. At present count, the finished jobs add up to ten—a miniature cradle, a table, pipe box, sconce, wall box, two vertical spice boxes, one horizontal spice box, and a wall shelf. The tenth? Well, that was an experiment, and the less said about it the better.

Since I possess just about enough manual dexterity to tie my shoelaces, no one has been more pleasantly surprised at this success than myself.

All Built from Scratch

I built these objects from scratch; that is, I didn't follow any blueprints or directions. If there was a design to be followed, I simply traced it freehand on the board. Or if the design was a little tricky, I drew it first on a piece of paper and then transferred it to the board with carbon paper.

My tools? My modest array would make a fine craftsman wince. But however few, or however wrongly used, they did the work for me. At present I have no workbench, but I'm thinking of making one. After all, why do things the hard way all the time? To set up shop, I just haul out two sawhorses, sit on one, and saw on the other.

Simple Tools Do the Job

I put together my first real job, a wall shelf and drawer, with a saw, hammer, nails, and pins. I used sandpaper—but not enough, for I was in a hurry to see what it would look like. Nevertheless, it looks fine and is still holding together. Except for staining, the piece was completed in one afternoon.

Since then I have acquired other tools, but not nearly as many as the sawdust seers say I should have. On my latest jobs I've used a square, saws (crosscut, compass, coping); plane, rasp, and file; also nails, sandpaper, and glue. Any shop veteran will tell you that's still a slim budget of tools for turning out even a birdhouse.

However, I'm learning—and I'm going to buy more tools, a backsaw, block plane, an assortment of chisels, and a spokeshave as a starter. And one of these days I'd like to pick up a lathe—so I can turn out legs as pretty as my wife's.

A bow front made as in the sketch on page 197 sets off the drawer of this colonial sconce.

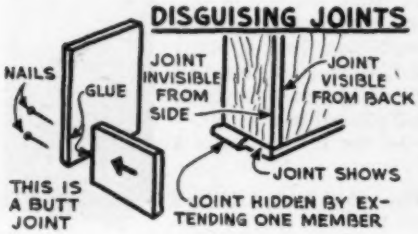
House plants now grow in a miniature cradle that I cut out and assembled in a few hours.

# of My All-Thumbs Craftwork

By now you've probably guessed that the Parker woodworking method is a path filled with pitfalls. But it gets the beginner going, and you learn a lot by trial and error. Any suggestion that you must have a full tool kit and a lot of manual ability can easily throw you for a loss. It did me until recently.

The same with plans. To me they're a waste of time. If you want to make an object that will serve some really useful or decorative purpose around your home, go and take a look at a similar specimen that's already built, or study a photograph or sketch (not a blueprint!) of it. Then set to work and make it. There's no reason you should be stymied by lack of experience.

Here's how I got started. Our home is furnished along early American lines, my wife and I both being fond of the sturdy colonial designs. We have one genuine old piece, a spinning wheel. Our other furnishings are the most tasteful adaptations and reproductions we could find. To add to them is a problem, for genuine antiques are very expensive and so many of the slick



Getting the legs even on this table gave me a bit of trouble—but I finally got 'em just right.

Like the original, this wall box boasts a hinged lid and a single drawer.

Opened out, the lid is seen as a T-shaped piece that pivots on pins run through ears on the end-pieces. The face of the drawer overlaps slightly.

and custom-tailored reproductions are wholly unsatisfactory. A polished, glistening commercial cobbler's bench, for instance, throws an early American room entirely off tone.

Unable to get what we wanted, I decided that perhaps I could make some colonial reproductions to brighten our scheme. My wife was skeptical.

Well, the results weren't perfect—far from it—but we're mighty pleased with them, and I'll stack the articles I've made against some of the real thing. The scars, nicks, and accidental lopsidedness of some of my pieces make them just so much the better. I'm not slipshod, however, and the absence of elaborate tools means that I must work just that much harder.

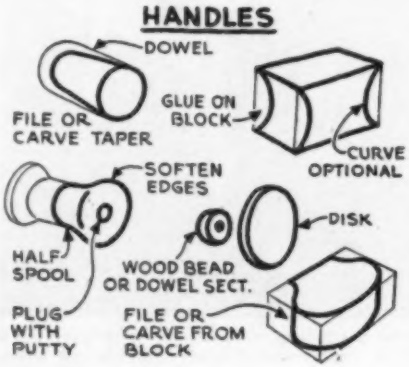
Ideas Gleaned from Magazines

My initial inspiration came from leafing through the pages of various magazines. I looked mostly for the small advertisements of companies and craftsmen that produce modest colonial replicas—spice boxes, wall boxes and shelves, spoon racks, chests, and small cupboards. There were many things that it seemed I might be able to make. I steered clear, however, of anything that would serve just as another cigarette container. I wanted my things to have a deeper utility than that.

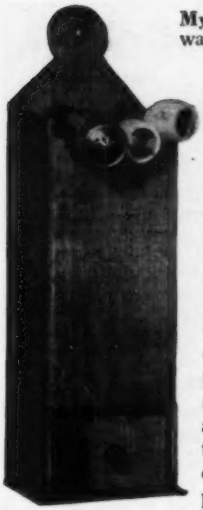
Most of these advertisements are illustrated, and the dimensions usually are listed —not all of them by any means, but you can figure out the rest yourself. It may surprise you to find what you can accomplish just working from a photograph.

Along with checking through magazines I visited a library and studied various handbooks and encyclopedias of early American furniture, mainly those illustrated with lots of photographs and sketches. Although I admired the chair, table, and cupboard designs, I knew they were not for me to follow—just yet. Instead, I pored over the pictures and descriptions of the pipe, wall, and spice boxes, the wall shelves, dough troughs, and sundry other small items, taking notes and making sketches of the designs that interested and pleased me.

In the library books I



Nine drawers made this tall spice box quite a task.



My pipes find a home in a wall box with fishtail back.

also found much useful data on the construction and finish of colonial pieces. The way they are joined, for instance, was all new and fascinating to me, for I never had used anything except a butt joint—the joining surfaces flat against each other. I still use only this simple joint, but sometime I'm going to attempt a mortise and tenon, and maybe a dovetail. For my purposes, however, the butt joint is perfectly satisfactory. Modern glues on the surfaces and nails driven through one member into the end of the other yield a surprisingly strong joint. The nailheads can be set and covered over with putty to be less noticeable.

I've also extended my research to the department stores and the antique shops. In this way, you can examine the old-time pieces thoroughly and see at first hand how they were put together and what designs were used. One of these days I'm also going to make a few visits to a museum or two with the same plan in mind. Whatever I see that I like will go into my sketchbook to be translated into wood later on.

The projects illustrated on these pages were all designed from originals made somewhere between 1700 and 1790. I'm not going to give any dimensions for these unless the editor forces me to.*

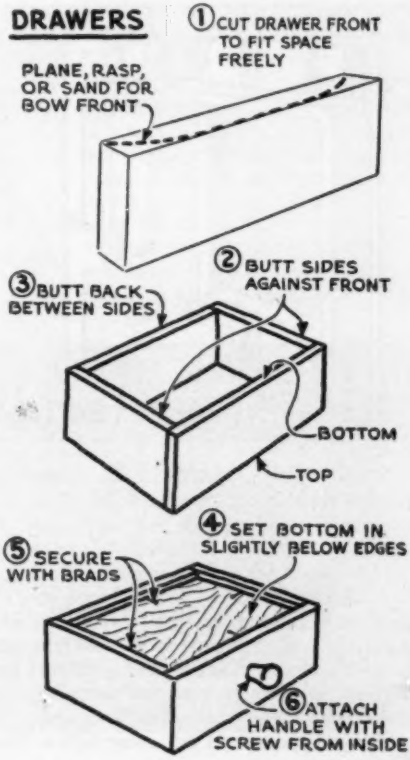
For these pieces I used either ¼" or ½" stock, the choice being mainly dictated by the size of the article and the wear it would get. The wood was anything I could get. The hard-luck stories you encounter at lumber yards these days become pretty tiresome, but if you hang on long enough you usually can get what you want. I used to tell them what I wanted the wood for, but they had alibis to thwart all my plans. Now I browse for myself and take what looks good to me. Usually I'm not disappointed. I've used pine and cedar so far, and a couple of times, when I was stuck, even some pieces from apple and orange crates.

I finished all my reproductions with pine oil stain, then applied shellac, and finally waxed them. I made some of the drawer knobs from ½" wood squares and bought others. One of the accompanying drawings suggests different ways of making them.

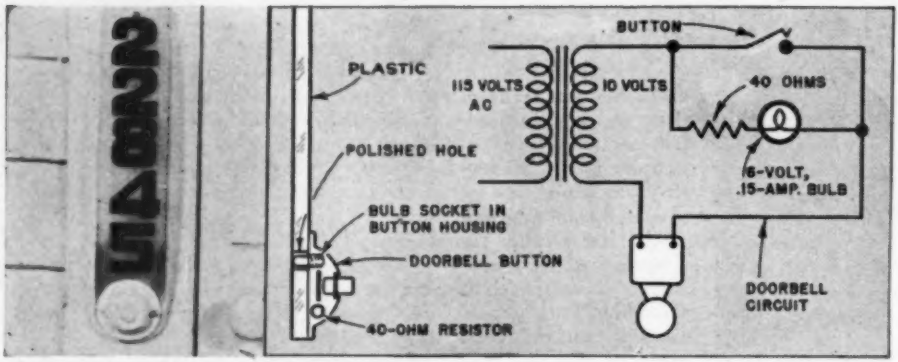
You Learn from Mistakes

To get started on such projects, the tyro craftsman just needs imagination and a normal amount of perseverance. Don't worry about mistakes. You'll learn from them, no matter what school of design you follow. Even now, when I think I've learned a lot and am getting pretty good, I'll make three drawers that are supposed to be the same size and fit them in. They'll be perfectly satisfactory, but by golly they won't be interchangeable—and this should be possible if they were exactly right.

But does it make any difference? Well, take a look at the photographs of my projects—and decide for yourself. END



* Dimensions are details. After all, you've got a thumb!

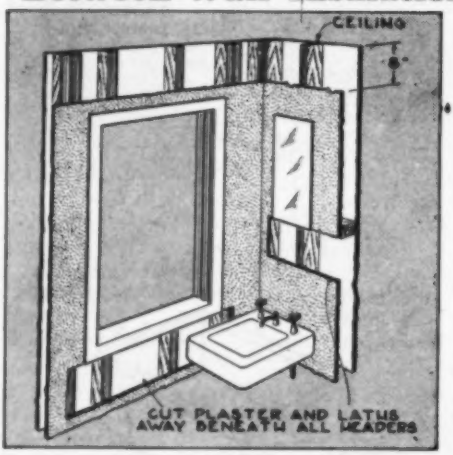


Edge-Lighted Plastic Shows Up House Numbers

ILLUMINATING a small plastic sheet bearing your address will light the way for friends and callers. The one shown is made of ⅜" by 2¼" by 14" stock. Numbers were painted on after the surface was sanded, but engraving clear plastic might be better.

A standard doorbell button serves to close the bell circuit and also to house a 6-volt bulb and 40-ohm resistor. The light is on all the time, but the bell doesn't ring unless the button is pressed because of the low current in the circuit. If it should, or if the transformer heats up, substitute a larger resistor.—PETER P. RUPPE.

Between-Wall Insulation Is Added from Inside



WHEN a particularly cold bathroom needed repainting, I took advantage of the opportunity to improve its insulation. At the ceiling and also 8" below, I cut through the plaster and carefully removed the laths.

In the clear spaces a flaky type of rock wool was poured in small quantities and gently pounded down with a weight suspended from a string. Medicine-cabinet and window headers prevent the insulating material from being pressed in from above, so additional spaces are cut away below these obstructions. Areas blocked by stacks, pipes, and electrical conduits are filled with a pellet-type rock wool. This need not be pounded, but it will go right through any hole at the floor level unless the hole is stopped by a few handfuls of flakes.

Batting is packed into the parts from which the plaster has been removed, and is held by replacing the laths. Plaster board was found most satisfactory for covering these areas, and the cracks are filled in with patching plaster.—L. G. LIGHTON.

New Device Limes Barn Floors

A ROTATING spreader that distributes bagged lime, superphosphate, or disinfectant chemicals is being made by Coburn Manufacturing Co., Whitewater, Wis. Farm practice and health regulations require frequent spreading of lime in dairy barns, and this device cuts the time and labor needed for the job. The material is spread in a wide, even band as the machine is pushed, wheelbarrow style, across the barn floor.

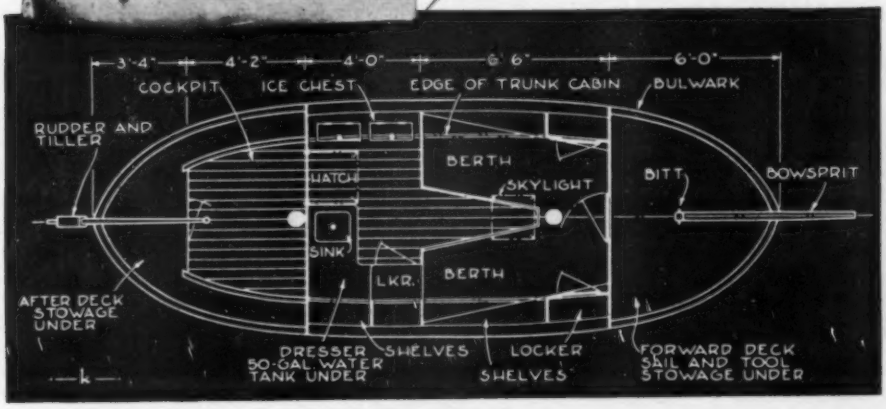
Lifeboat Converted to Schooner

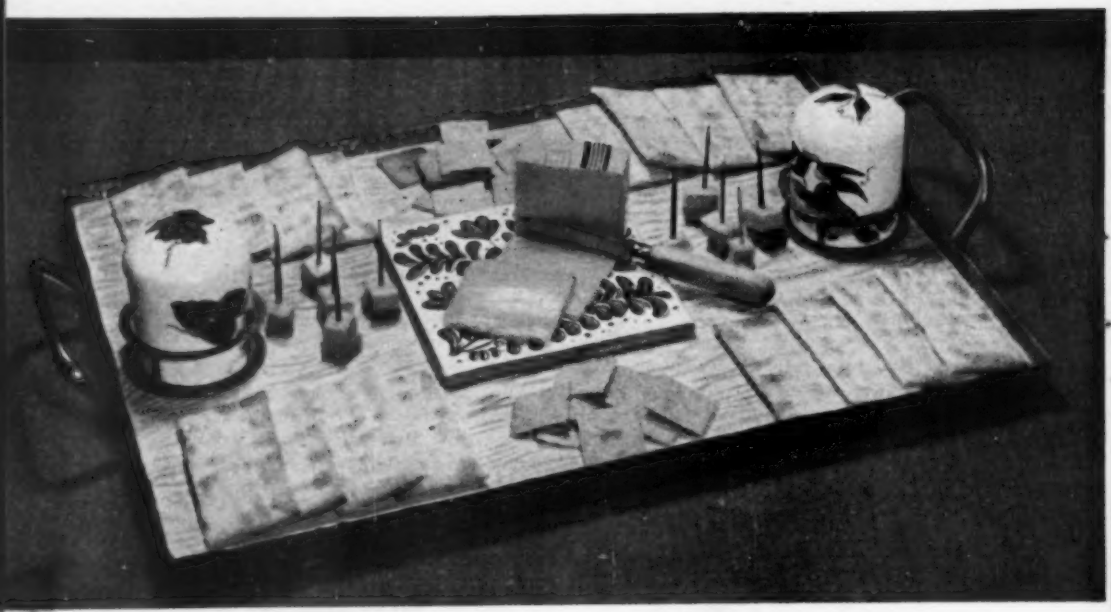
BOUND out of Aruba during the war, the tanker *Esso Bolivar* was torpedoed in the Windward Passage. All that came ashore on the Haitian coast was one lifeboat, empty.

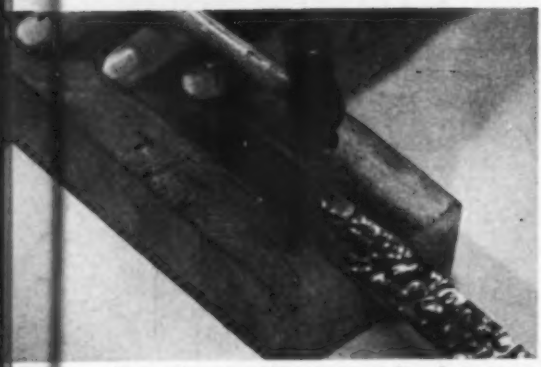
Bidding at a public auction, William A. Krauss bought the boat for $22.50. With about $350 for materials (plus some fittings scrounged around Haitian waterfronts), Krauss converted her to the sturdy little schooner yacht shown here. He welded on a 2,000-lb. keel, added a 5′6″ by 10′6″ cabin with decks and cockpit, and installed a bald-headed schooner rig with a sail area of 500 sq. ft. The result was a handy little craft measuring 24′ over all, 8′ beam, and 3′6″ draft.

Underneath the foredeck is a peak locker with space aplenty for stowing sails. In the cabin are two 6′6″ berths, lockers, shelves, water tank, and galley sink. Under the afterdeck is space where Krauss keeps his cookstove, which is simply a sandbox and a charcoal brazier, as on many Haitian coastwise craft. At mealtime the rig is brought into the cockpit, where cooking odors and heat are no problem, and afterwards restowed.

Of her performance, her proud owner writes: "She's not fast, but she's brawny, which, in West Indian waters, is a detail not to be ignored. One afternoon she punched us through a 75-knot wind in the Foso Road (we took it on the starboard quarter and ran on the headsails). Her best time for 10 nautical miles is 1 hour and 19 min.—lively enough for our purposes. The schooner rig, which might meet reasonable opposition in some sailing areas, seems to us exactly right for Haitian waters, permitting the handiest reduction of sail when she meets tropical squalls."—JOHN G. KINGDON.





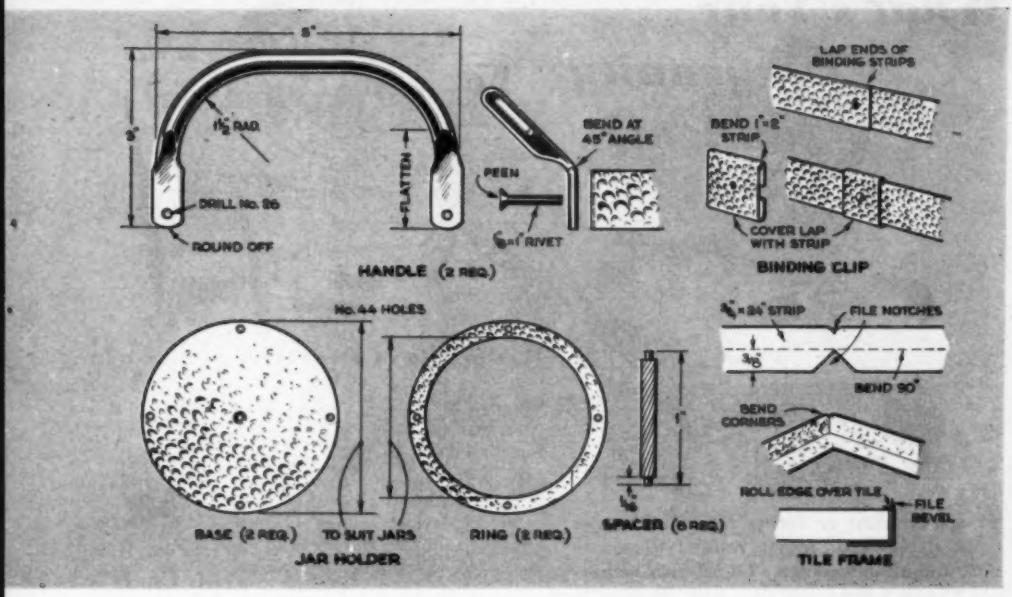


Peen a hammered pattern on the edging strips and the disks and rings of both the jar holders.

Snack Tray Combines Wood and Copper

Assemble the jar holders by heading over the ends of the spacers. Cut eight spacers 1" long from No. 8 copper wire, turning down the ends.

Fasten the tile holder with small wood screws as in the center. After slipping in the tile, gently roll down the upper edge of the frame.



By Bill Luther

BESIDES adding a bit of color, the tile that's attached to the center of this tray has two practical functions. You may rest the teapot on it—or you may use it as a cutting board. You'll want to buy the tile, as well as the ceramic mustard and mayonnaise jars, before you start construction, and then proportion their holders accordingly.

Begin by cutting a 14″ by 20″ panel from ½″ plywood. Then, after sanding the best face, rub on a thin coat of white lacquer, wiping off the excess. When the lacquer has dried, rub it down with very fine abrasive paper and plenty of oil, leaving only enough white to bring out the wood grain.

For the edging, cut two strips of 18- or 20-gauge copper 1″ wide and 34″ long. Form clips to join the two strips at each end of the tray from 1″ by 2″ pieces of the same stock. After peening and polishing, hold the binding in position around the tray and lay out pilot holes for ⅝″ copper tacks. Then, with the edging still in place, make holes through the copper and into the wood with a No. 50 drill.

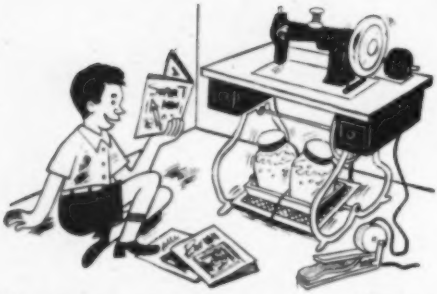
The handles are 11″ lengths of ⅜″ copper tubing. Heat to a dull red color, cool, and shape with the fingers around a 1½″ pipe. Flatten the ends, drill No. 26 holes in each, bend all ends to the same angle, file smooth, and round off. After polishing with steel wool, center the handles on the tray and drill slightly undersize holes 1″ deep into the wood. Holding the handles in place, drive in ⅛″ by 1″ flathead copper harness rivets, peening down the heads.

From 18- or 20-gauge copper cut two disks and two rings to suit your jars. Space four No. 44 holes around each piece and at the center of the disks drill another, countersinking it for a flathead brass screw ⅜″ long. For the spacers, saw eight 1″ lengths of No. 8 copper wire and file or turn down the ends so they can riveted in the disk and ring holes.

From sheet copper cut a ¾″ strip 24″ long or whatever length is required to go around your tile. After filing notches for the corners, bend the strip 90 deg., drill and countersink No. 44 holes in the bottom face for small wood screws, and bevel the top edge with a file. Then anneal the copper, form it around the tile, and attach the frame to the tray. Now slip in the tile and, with a small punch, gently tap the edge of the frame over it. Finally, use a round-end rod to roll down the edge.

Mask off the tile and apply a thin coat of lacquer to the entire project. When thoroughly dry, rub down the wood panel only with fine paper and oil. Leave the lacquer on all of the metal parts.

What's Your Ingenuity Quotient?



It gave me a turn to be without a churn when my mother wanted 5 gal. of cream made into butter. Luckily we had an old treadle sewing machine with an electric motor drive attached. I tied two cheese boxes to the treadle, and two 2-qt. fruit jars into the boxes. Leaving the motor in drive position, I put on the belt to the flywheel so the treadle would rock. With a board wedged into the foot motor control, the treadle churned a gallon every eight minutes, with no help from me.—BILLY LOCKART.

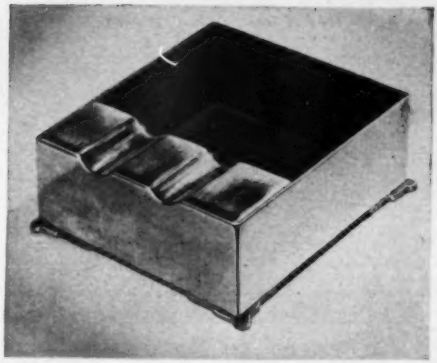
I tackled a dent in my car door with a football. It was a simple oil-can dent that would pop out if pushed. Not being small enough to get inside the door to hammer it out, I had to do it the easy way. I deflated a football, attached a tire pump to its stem, and pushed the football down into the door, centering it behind the dent. Pumping up the football snapped the metal back into place. Touchdown!—J. C. SIGHTLER.

Radio Plays Detective. A broken wire was hiding out somewhere in an electric heating pad I had to fix. Knowing it would be tough to locate the break, I looked for something to put the finger on the culprit. I turned on the radio, connected the pad, and flexed it part by part until the radio squawked. Then I knew I had my fingers right on the trouble, and fixing it was easy.—DENNIS WILLIAMSON.

Even ringing twice, the postman couldn't lick the trick acoustics in our house, because in some rooms the door buzzer just couldn't be heard. I solved the problem by mounting the buzzer on a cold-air return duct in the basement, using self-tapping screws. With all the air ducts of the heating system to pipe the sound, the buzz is amplified to an attention-getting level everywhere in the house.—A. L. BREEN.

Have you pulled off a smart one lately? We will pay for acceptable contributions showing ingenious solutions of problems in the home, shop, garage, or camp. It doesn't matter if it's wacky — if it works.

Man-Size Ash Tray



EVEN a chain smoker won't fill up this ash tray in a hurry, for it's a full inch deep. Made of gleaming brass, it can be decorated with a monogram if you like.

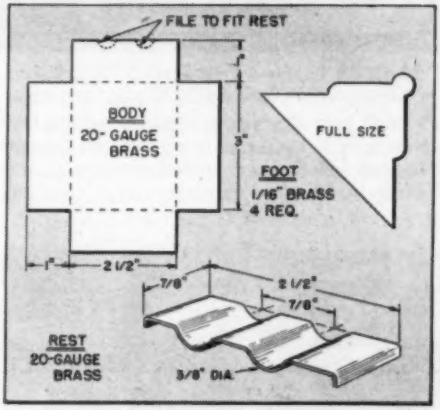
On 20-gauge sheet, lay out the body pattern shown. The lines will show up better if the metal is first scrubbed with kitchen cleaning powder. From a 1" board cut two blocks 2½" by 3". Clamp the body blank between these blocks in a vise, lining them up carefully with the center section shown dotted in the drawing, and bend over the projecting parts with a mallet.

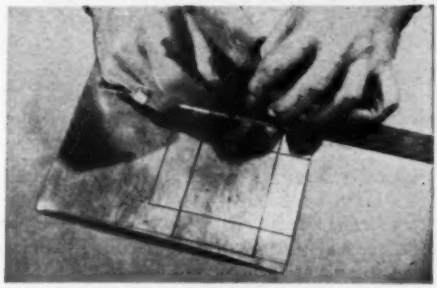
File the corners, if necessary, to fit with no visible gap. Wrap a piece of black-iron wire around to hold it together for soldering. Stand the piece on one corner, and put a little flux and bits of solder inside the joint. Then apply heat until the solder runs freely along it. If you've been sparing of solder, little will have flowed out. Clean off any excess with files and abrasive cloth.

Feet can be cut from 1/16" sheet with a jeweler's saw, or you can cut a simple triangle and file it to shape. Tin the feet and the tray corners; then sweat the feet in place. Polish the undersides so that the feet won't mark table surfaces.

Cut a ⅞" by 3⅛" strip of 20-gauge sheet for the cigarette rest. Lay it on a grooved block and form it by hammering on a ⅜" dowel or rod laid over the grooves. Bend down both ends, tin them and the contacting tray surfaces, and sweat the rest in place. Then file notches in the body flush with the grooves in the rest.

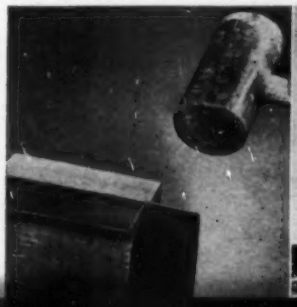
Steel wool will create a satin finish, or you can get a high luster with tripoli and jeweler's rouge. Wax the metal to prevent dulling of the finish.—BILL LUTHER.

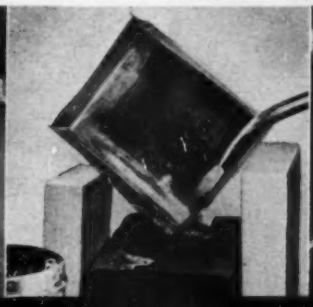


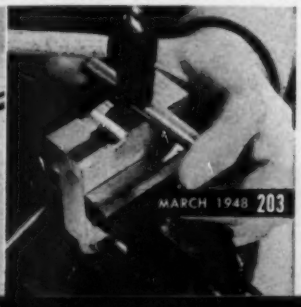


Lay out the pattern on 20-gauge sheet, using square and rule. Cut along outside lines only.

Shape the blank by clamping it between two wooden blocks and hammering down the sides. Bind the four corners and run solder into the joints by applying heat (center). Hammer the grooves in the cigarette rest with a rod or dowel, using a wooden block with notches as an anvil.







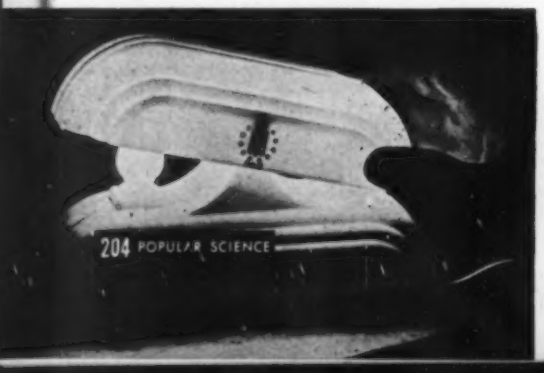
Makes Coffee for One. With this device you can make coffee a cup at a time. Placed over the cup, it operates on the drip principle, hot water seeping through the coffee and a cloth filter. Priced at about $1, it is made by Hartford Products Corp., Chicago.

It Washes and Rinses. A dishwasher made by L. K. Franklin Corp., Los Angeles, consists of a brush on a hose that attaches to the faucet. For washing, water mixes with a detergent in the head. For rinsing, a button turns on clear water.

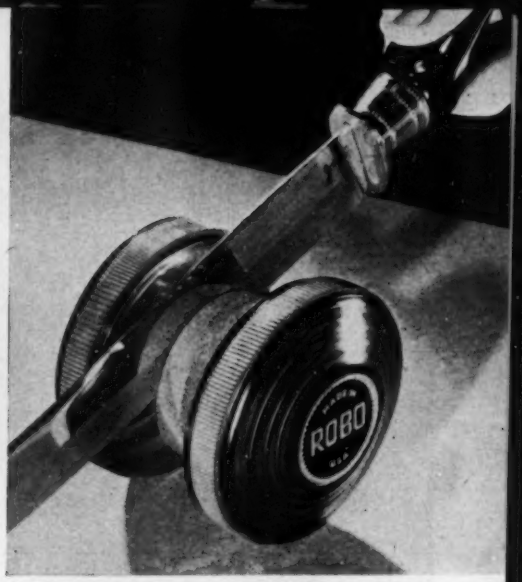
Heater Is Pocket Size. Whether you're at home or deep in the wilds on a camping trip the little gadget at the left offers a means of quickly heating liquids or canned foods without a fire. A product of wartime research, it's called the "Heatron stirrer" and is produced by the Catalyst Research Corp., Baltimore, Md. When the plastic handle is pulled back and released, an internal spring sets off a chemical charge, generating intense heat without fumes. The charge fits into a copper housing.

Shade Turns on Light. The shade of a night lamp offered by Hungerford Plastics Corp., Murray Hill, N. J., also serves as the switch button. If you tilt the shade in one direction, one of two seven-watt bulbs goes on. Tilt it the other way, and the second goes on. Tilt it again, and the light goes off. The lamp sells for about $3.

Hose Connector Swivels. The faucet hose connector pictured below contains an elbow that can be rotated through a full circle. Hence, the hose is less likely to be damaged by being bent near the faucet end. In addition, the straight pull extends the radius of the hose. The Kiener Machine Products Co., Los Angeles, makes it.



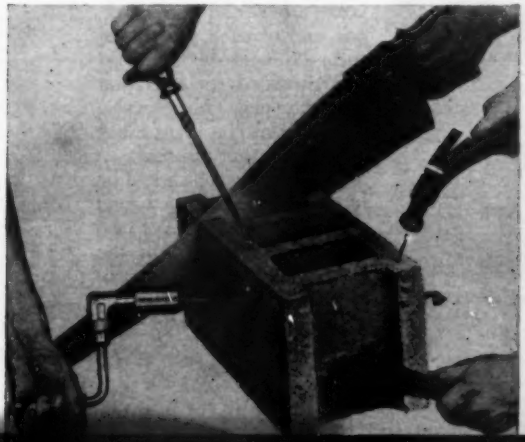
Pen Carried on Key Ring. Little larger than an ordinary matchstick, this ball-point pen was designed for carrying on a key ring; in fact, the ring is supplied with the pen. Made of metal, the pen has an outer sleeve that slips down over the point to keep ink from soiling your pocket. A product of the Carter Company, Elizabeth, N. J., the pen is not refillable, but the ink charge is said to give about a year of ordinary use. The pen sells for about 50 cents.

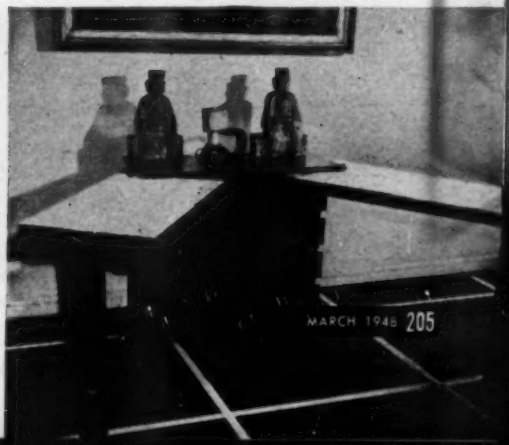


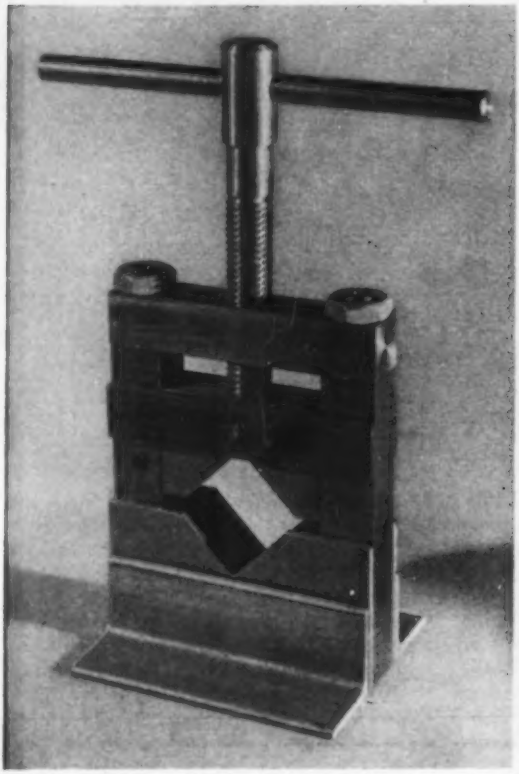
It Sharpens as It Rolls. With this knife sharpener, you insert the blade between the grinder and one of the two plastic wheels. This automatically adjusts the knife edge to the correct angle. Then you roll the sharpener back and forth on a table with a simple pull-push motion of the knife. Ten times forward and back on each side is said to give a keen edge. It's made by Alden Speare's Sons Co., Cambridge, Mass. The stone is fine-grain aluminum oxide.

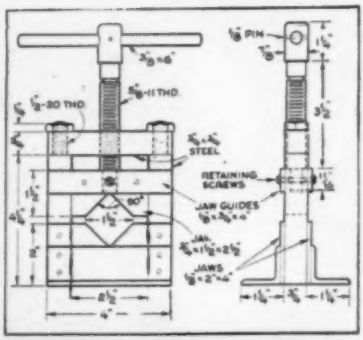
New Blocks Made of Fiber. The busy scene below illustrates the ways you can work a new type of building block. Consisting largely of wood fiber bonded with special mastics, the block looks like a conventional concrete block, but it weighs only half as much. Tests have shown that the blocks are resistant to fire and have good insulating power. Made in the same sizes as cement blocks, they are distributed by Marketing Associates, Saginaw, Mich.

Table Swings Against Wall. As one unit of a new line of furniture adapted to the limited space of an apartment or small home, Paul Bry, a New York designer, has introduced this fold-away table. Normally, the two halves of the top are kept back against the wall, but when mealtime comes they can be swung together, providing a table 36″ wide. Silverware and other items may be stored in the drawers below the center section of the table.









Made with smooth or toothed jaws, this vise will do many jobs in the home shop. Ends of the side posts are turned down as above and then threaded for nuts that secure the yoke.

Vise Grips Round Stock

HERE's a little pipe vise that will serve its builder well. If the jaws are finished smooth, it can be used for polished tubing. If teeth are cut in the lower jaws, it becomes a regular pipe vise and will grip as well as any you can buy for the purpose.

It was made entirely from cold-rolled steel short ends, available as scrap from most steel supply houses. The side posts and top crossbar yoke are ¾" square stock, one end of each post being turned down to ½" diameter and threaded for nuts that hold the yoke. The yoke also is drilled at the center and tapped for the vise screw.

All of the parts are made from cold-rolled steel short ends.

If the lower jaws are to be left smooth, cold-rolled steel will do. Otherwise, it's best to use tool steel with the teeth milled in and hardened and drawn. Two 4"

lengths of 1½" angle iron are flush-riveted through the lower jaws and posts as a base.

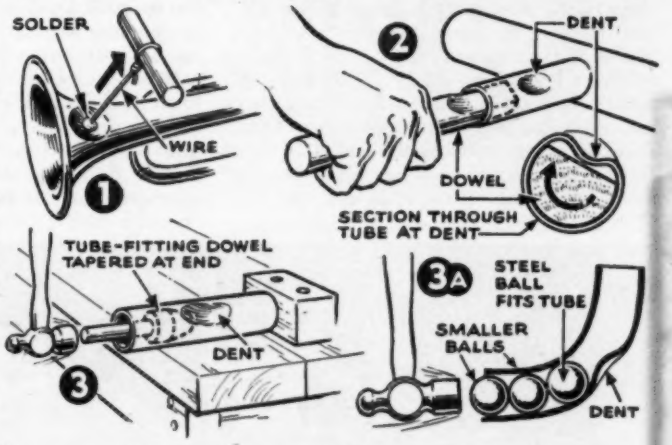
Drilled to a depth of 11/16" at the center to receive the end of the vise screw, the ¾" by 1½" by 2½" movable jaw should be a snug sliding fit between the side posts. Two ⅜" by ¾" by 4" guide plates are riveted to the sides of this jaw, and a hole is drilled and tapped on each side for retaining screws. The ends of these should fit loosely into a groove turned in the end of the vise screw, holding it in place but allowing it to revolve freely.

For the screw, turn down a ⅞" rod to ¾" except for a head 1¼" long. Turn the other end even smaller to suit the hole drilled in the movable jaw. Thread the screw ¾"-11 or similarly, cutting the threads on the lathe if possible. However, die-cut threads will be satisfactory if care is used to start the die accurately. To do this, hold the work in the chuck, place the die squarely against a drill pad, and then feed both the die and drill pad against the work with the tailstock hand wheel while turning the spindle by hand.

Cross-drill the head for a drive-fit ¾" by 6" hand bar. When this has been centered, drill the head and bar for a ⅛" pin. Driven in, this pin keeps the bar permanently in place. Turn down the vise screw into the movable jaw, adjust the retaining setscrews, and the job is finished.—C. W. Woodson.

Tube Dents May Be Removed by One of These Ways

When thin metal tubing has become dented, it usually can be straightened by one of the methods illustrated here.



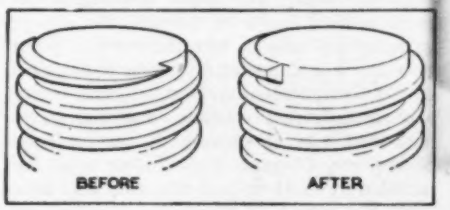
If a dent occurs in a brass musical instrument where it cannot be pressed out, solder a small loop of wire to the lowest part, tie string to the wire, tie the other end to a piece of wood as in Fig. 1, and bring the metal back to place with a few careful jerks. Then remove the soldered wire and clean and polish the metal.

For straight tubing, you can turn a hardwood dowel to the exact bore of the tube, make a flat on one side, insert until the flat comes under the dent as in Fig. 2, and turn slowly to force the metal back into shape. A tapered dowel (Fig. 3) also will do the job. If the tubing is open at both ends, you can also use a steel ball exactly the size of the bore, inserting two or three balls of smaller diameter behind it to drive the full-sized one past the dent. The leading ball will then press out the metal.

For bent tubing use the ball method as seen in Fig. 3A.—Herbert E. Pott.

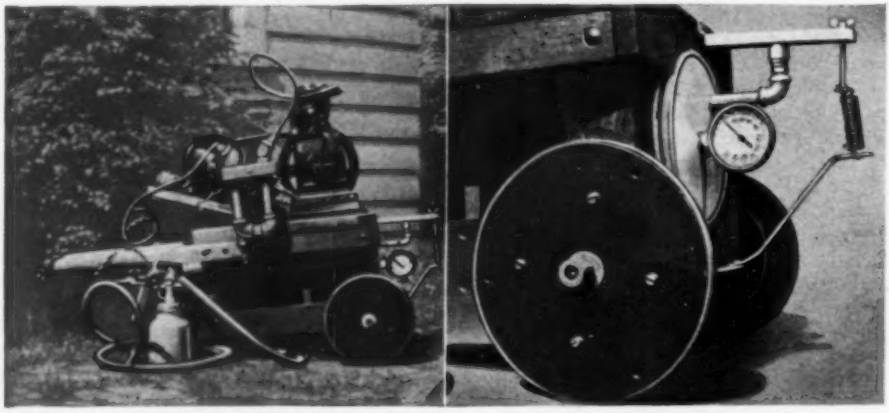
Grinding Off Thread Improves Action of Chuck

Although I have always tried to keep the internal threads of my four-jaw chuck clean, the screws nevertheless become clogged by chips after a while and difficult to turn. I have found that this can be prevented by grinding off the incomplete part of the thread. The squared end then has a sweeping action.—Marcel Duhamel.



Bottoming Drill. Flat-bottom holes can be produced with a bit you can quickly make in any size needed. Select drill rod of the required diameter, or turn it to size. Mill or file one end to exactly half its diameter for a length of ¾" to 1¼". This flattened portion is critical; if it's more or less than half diameter the edge cannot cut freely. Form a 15-deg. bevel on the end as at right above. Heat the tool red hot and quench in motor oil. Polish off the scale and reheat to a medium straw color. Quench immediately in the same oil. If the color turns to blue, the tool will have to be rehardened. Touch up the edge with a fine stone after hardening and tempering.

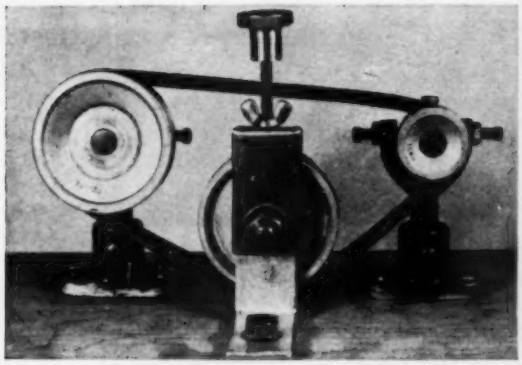
Since the action is that of a single cutting edge, the tool should be used in a lathe or drill press run at slow speed, the work must be securely held, and the hole should first be drilled to within 1/64" of finished size with a regular drill.—W. E. Danneman.

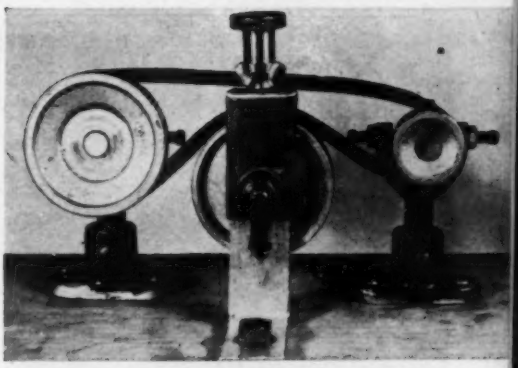


Compressor Cost $10. By using salvaged parts, Francis S. Root, of Northampton, Mass., assembled a portable air compressor that can be taken to the garage to pump up tires or into the yard to paint a fence. The compressor proper came from an old refrigerator. A ⅛-hp. electric motor was taken from a washing machine, and a tank from a 5-gal. sprayer. To keep oil out of the air, 1" pipe and elbows were assembled into a U-shaped filter unit and filled with steel wool.

An inexpensive pressure gauge was installed, together with a homemade relief valve to maintain the desired pressure. The valve consists of a hinged lever carrying a rubber plug which rests against the open end of an elbow connected to the tank. Relief pressure is set by tensioning a spring fastened to the lever with a bolt and nut.

The compressor is driven by an auto fan belt, and connected to the tank by copper tubing. Everything is mounted on a wooden frame supported on two wheels at one end.

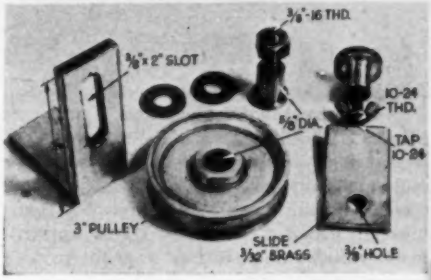




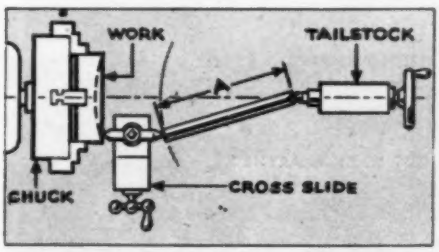
Idler Tightens Belts. V-belts stretch and then slip on their pulleys. If you have this problem, the adjustable idler above may prove the solution. It runs almost silently, provides a wide take-up range, and runs outside or inside the belt.

The base is a piece of ¼" by 1¼" angle with a slot drilled and filed out. The slide is a boxlike piece bent to shape over the angle to a free sliding fit, and tapped at the top for the adjustment screw. Any standard pulley of reasonable size can be used. The one shown has a flat face with flanges ⅛" high, for running outside the V-belt.

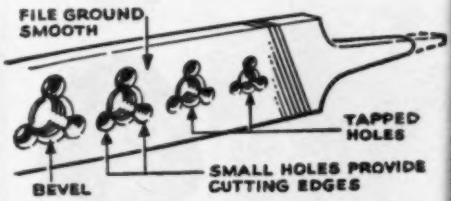
A stud was turned to fit the hole in the pulley, shouldered, and threaded for the clamp nut. You could use instead a finished machine bolt and a nut on each side of the slot to clamp it.



Make the tensioning screw from a 10-24 bolt about 2" long, threading on a wing nut. A knurled head might be added but isn't necessary. Mount the base alongside the V-belt, adjust tension by the 10-24 screw, and clamp by tightening the nut on the stud.—Jack Mellinger.



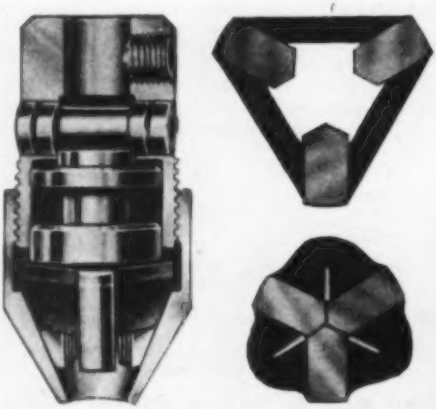
Turning Concave Radius. To turn a true face radius, cut a piece of drill rod the length of the desired radius A. Lightly centerdrill both ends. Set a double-ended tool bit parallel to the ways with both ends at center height, and put the rod between it and the dead center. Advance the bit into the work with the tailstock. Then, holding the carriage back against the rod with the handwheel, traverse the tool with hand or power cross feed.—F. W. Bisker.



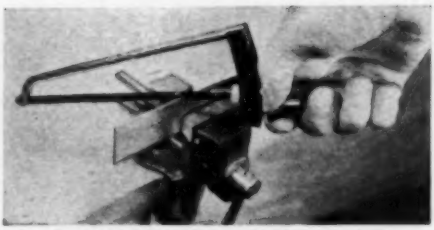
Old File Is Screw Plate. Taking little space in your toolbox, a screw plate made of an old file is handy when a number of different threads are required. Anneal the file by heating it cherry red and burying it in ashes, and grind off the teeth. Drill and tap to suit, using tap drills one size smaller than usual. Then drill three intersecting holes around each tapped one, first punching them carefully so they won't "fall in." Countersink the main holes slightly, reharden the file, and draw it to a light straw color.—H. E. Pott.

NEW TOOLS

Midget Drill. A hand-sized electric drill produced by the Wolfson and Fairclough Mfg. Co., Buffalo, can do the work of larger drills but is particularly handy for craftsmen and hobbyists who work in small scale. The unit, priced at about $7, operates on 115-volt, 60-cycle AC at approximately 600 r.p.m. It has a pistol grip, a trigger switch, and a ¼" chuck.



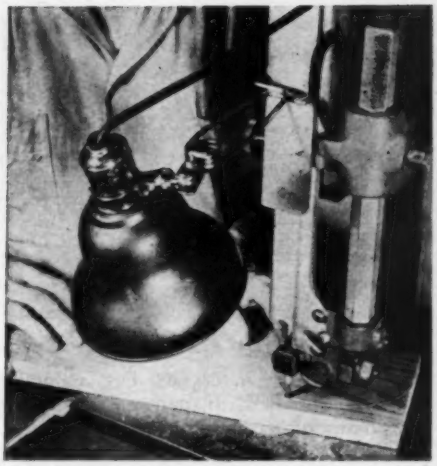
Chuck Uses Rubber Insert. In place of the usual spring-held jaws, this new line of chucks from The Jacobs Manufacturing Company, Hartford, Conn., utilizes a single molded rubber triangle to which the jaws are permanently bonded. In one model the chuck is hand tightened on the drill or other tool; in another (illustrated at the upper left) it is first hand tightened, then made machine fast by means of a hex key that turns the cam above the follower.

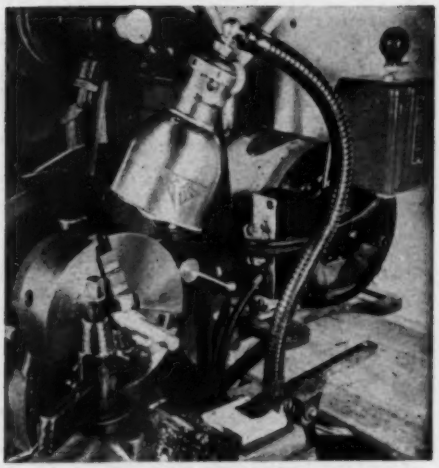


Saw Has Adjustable Angle. A 49-cent hacksaw with variable blade angle permits the workman to do internal cutting in spaces too small for the usual saw. Handle and blade move up or down inside a channel, and the cutting depth is variable up to 3". A knurled nut locks the blade in the desired position. It's made by Wilson Hardware Mfg. Co., Chicago.

Gun-Grip Iron. A soldering iron with a pistol grip is easier to hold and use on certain types of work. An offset tip of the kind illustrated allows the solderer to work from directly above on joints that would be hard to reach with a standard iron. The handle is molded plastic with low heat conductivity. Lenk Manufacturing Co., Newton Lower Falls, Mass., makes the 75-watt iron and four interchangeable tips.

Calker Snaps on Cartridge. A spouted calking cartridge may be slipped into this injector without disassembling the gun. Then the compound is forced out by a pressure plate ratcheted forward by a trigger. The Gibson-Homans Company, Cleveland, designed this low-priced ($1.98) gun chiefly for minor household repairs such as sealing cracks or replacing putty.





Clamp-on Lamps Put Light at the Point of Work

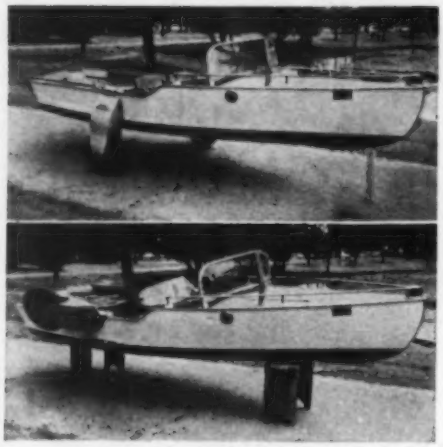
General shop illumination, even when at a fairly high brightness level, is often not good enough at the point of work. I find that portable clip-on lights that can pour on brightness exactly where you need it are an aid to better workmanship, reduce work spoilage, and help prevent accidents. Two kinds are especially good: a spring-jaw type with a double ball-and-socket adjustment, and a clip and gooseneck type with a single ball-and-socket. The former is best used in close, with a 25-watt bulb; the latter lights a bigger area and takes a 60-watt bulb.—John P. Arnold.

Close Chucking Saves Drills

Frequent breakage of very fine drills can be reduced if they are chucked short, as shown above. If the chuck itself won't permit this, run a ⅛″ drill up into the chuck body, thus getting clearance for drill shanks. Very high spindle speeds and good cutting oil also help cut down excessive breakage of these small drills.—C. W. Woodson.

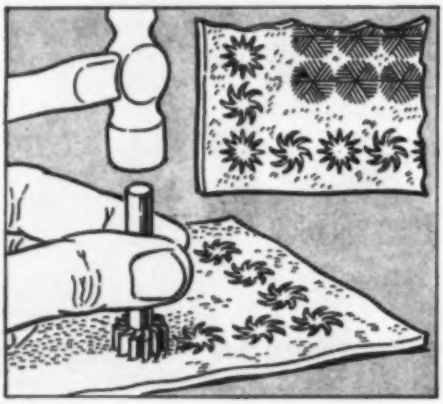
Pad in End Improves Pin Vise

Small pin vises of the sort shown can be made easier to use, and breakage of tiny drills can be lessened, if you turn yourself little brass finger pads designed to fit freely in the pin-vise handle. As with a jeweler's screwdriver, the vise is held against the work with one finger while it is twirled.—H. R. Pfister.



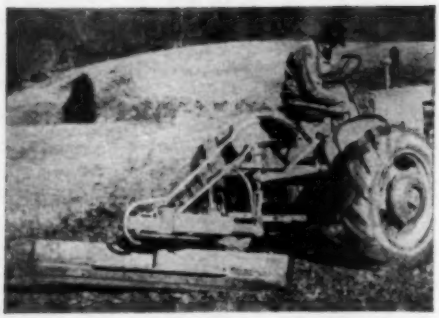
Boat-Trailer Wheels Retract

DESIGNED to fit most inboard and outboard hulls, the rig shown above makes it easy to transport your boat behind a car. At the waterside, the wheels can be retracted inside the hull along the gunwales, hung outside on the oarlocks, or removed entirely and left ashore. Including a car bumper attachment, the outfit weighs less than 50 lb. It is produced by the Saha Manufacturing Company, of Darby, Pa.



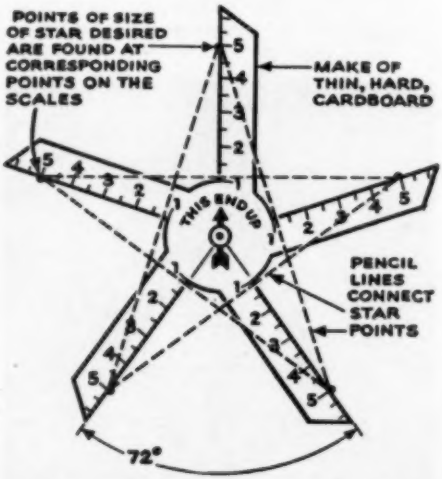
Rotary Files Decorate Leather

ROTARY files are ideal for punching decorative designs on leather projects. Simply place them on the leather at the desired point and strike the shank a good blow with a hammer. In finishing up a leather knife sheath, I used files of three different types and found the effect they produced to be very attractive.—GUTHRIE B. STONE.



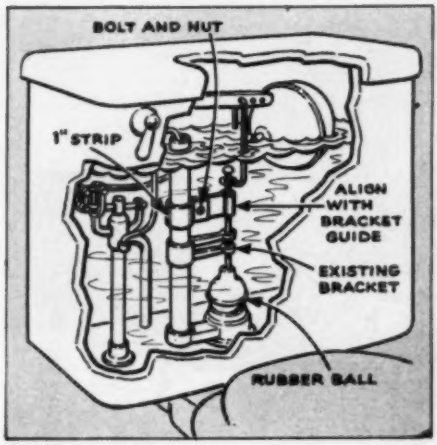
Tractor Blade Does Many Jobs

BUILT to turn a full 360 deg. on roller bearings, this tractor blade was designed for all phases of terracing, grading, scraping, bulldozing, and ditching. Intended for one-man operation, it may easily be raised, lowered, or set at any desired angle from the tractor seat, and an adjustable top linkage regulates the bite. The Danuser Machine Company, of Fulton, Mo., produces it for leading makes of tractors.



Guide Makes Five-Pointed Star

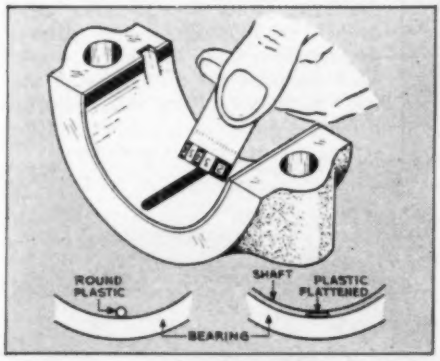
CONFRONTED by the task of making some five-pointed stars, I laid out a guide like the one above on a sheet of cardboard and then cut it out. By using this, a star of any size can be produced by making a mark at corresponding points on each scale and connecting the points with straight lines. In laying out the guide, place corresponding edges of each arm exactly 72 deg. apart as shown above.—G. W. MORTON.



New Bracket Seats Ball Valve

It became necessary to wiggle the flush handle of a toilet before the ball valve would seat and stop the water, as the ball rod stuck at an angle in the guide.

With 1" strip aluminum, I formed a loop just large enough for the ball rod to slide through and bent the other end around the upright overflow pipe, clamping with a bolt and nut. The ball now drops straight into the outlet.—Eric Ritter.



Clearance Measured from Flat

Engine bearing clearance may be quickly checked with a new method offered by the Perfect Circle Corp., Hagerstown, Ind. It consists of placing a length of round plastic on the bearing shell and tightening the bearing cap. The cap is then removed and the width of the flattened plastic is measured with a scale on the envelope in which the plastic is packaged. The reading is directly in thousandths of an inch clearance.

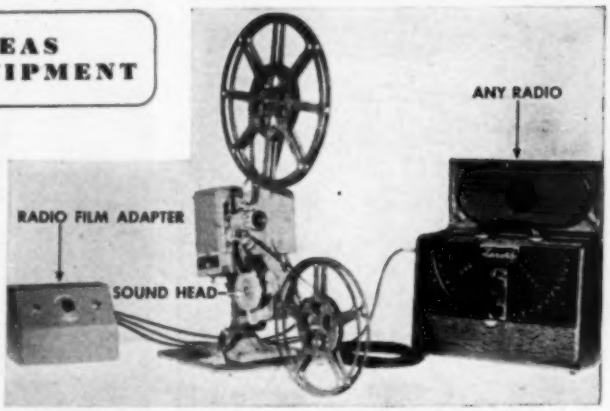
Mission Stairs Conserve Space

Although staggered stairs may sound like an architect's nightmare, they're a practical way of reaching a small upstairs room without utilizing too much floor space. Stairs of this type were often used in the old Spanish missions of the Southwest.

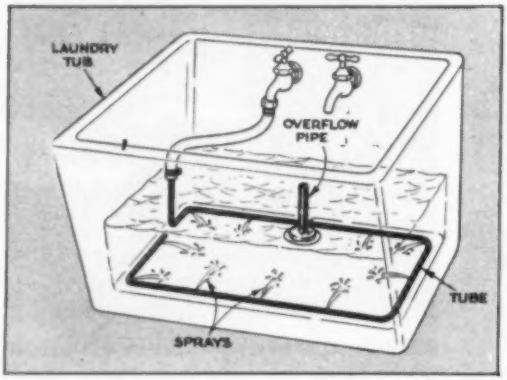
Pictured above are the stairs in the Spanish style custodian's home in a Texas state park. These were made from two logs of 24" diameter, one red elm and the other hackberry. After opposite sides were squared off, steps with a 12" tread and 12" rise were sawed the length of each log. Then they were installed in an offset manner.

This gives the effect of a stairway with a 6" rise and 12" tread. However, the horizontal distance between the first riser and a vertical line from the landing is only half what a normal stairway of these dimensions would require.—Isabella H. Alden.

PHOTO IDEAS AND EQUIPMENT

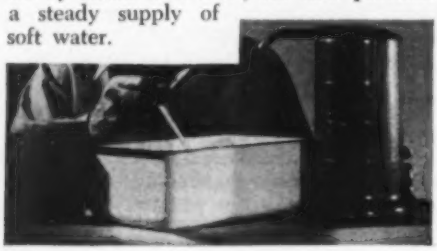


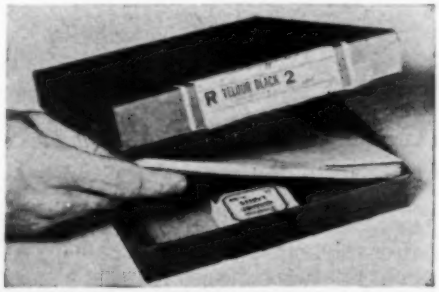
Sound Projector. With a sound head and adapter offered by the Apex Video Company, of Roscoe, Calif., you can add sound to any 16-mm. movie projector, using a radio as the amplifier. Costing less than $60, the unit can be installed by any home-movie fan and readily removed at any future time. At the heart of the scanning system is a photoelectric tube that is said to give increased response and fidelity with low scanning-beam intensity. Other features include ball-bearing driven parts and an automatic wiper. For those who do not wish to use a radio, an amplifier and speaker are available.



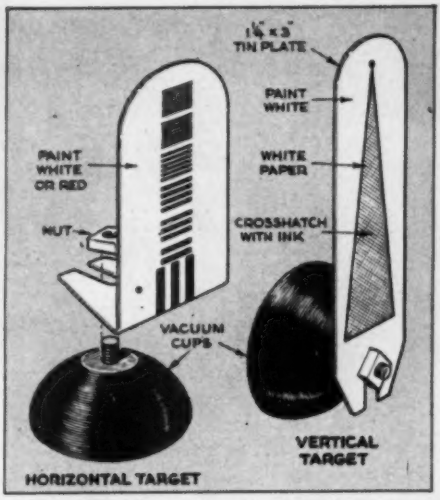
Sprays Agitate Prints. Made from copper tubing, this print washer does a good job. The tubing was bent by hand around a piece of pipe, the tubing being moved a fraction of an inch after each of a succession of slight bends. In this way you can get a reasonably sharp bend without flattening the tube. Then No. 58 holes were drilled at intervals, being slanted slightly downward so the jets would keep the prints off the bottom of the tub. An overflow pipe was made by drilling a rubber sink stopper and inserting tubing.—J. W. Grosdidier.

Filter Improves Solutions. The chemicals that are often found in ordinary tap water and make it hard may be removed by using a portable filter made by the Sierra Water Softener Company, of Los Angeles. The water then is more suitable for mixing photographic solutions. Attached to a faucet by means of a hose, the filter provides a steady supply of soft water.





Don't Fumble for Paper. A small object inserted under a boxed supply of projection paper will facilitate darkroom routine. Since the object will keep the paper at an angle, you can get a sheet without fishing at the bottom of the box.

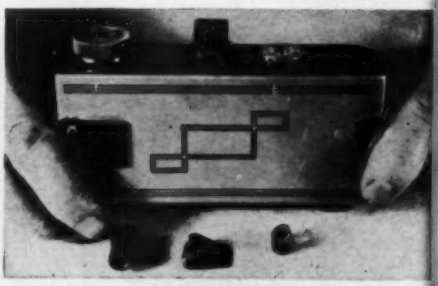


Targets Help You Focus. Three critical-focus targets mounted on vacuum cups are very useful for closeup photos, especially when the subject itself has no sharp lines to focus on. Two are placed in the horizontal plane to check the depth of focus. A third, moved about on the background, shows the area covered.

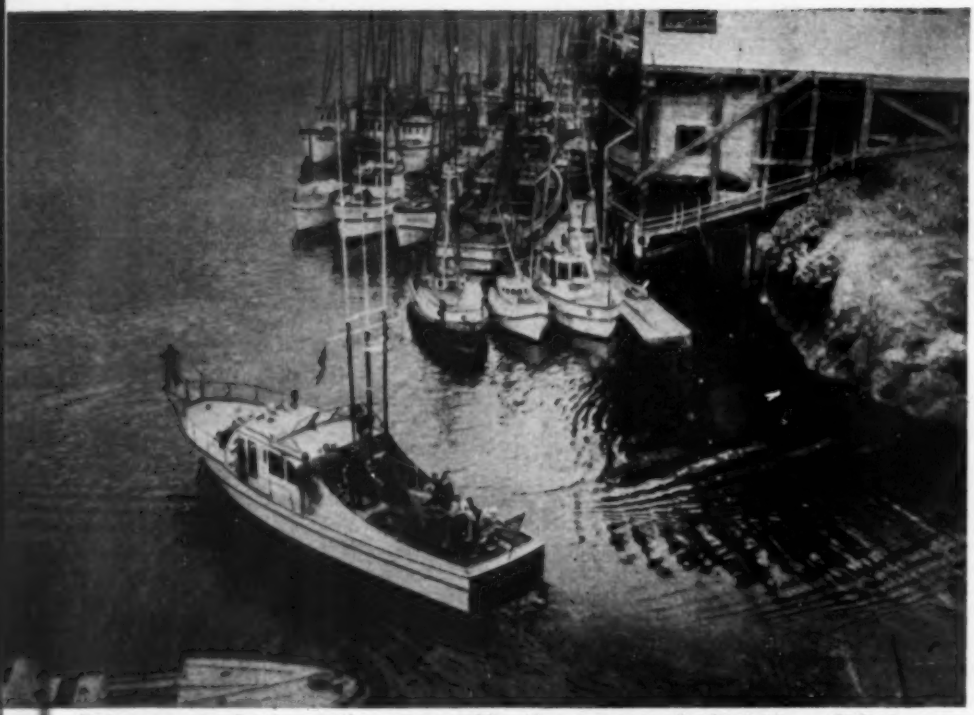
For the two horizontal targets above, variably spaced parallel lines were cut from Bureau of Standards lens-resolving charts, obtainable from the Superintendent of Documents, Washington, at 40 cents. To make the targets easily distinguishable on the ground glass, the border of one was painted white, the other red, and chart lines run in opposite directions. Simple crosshatching with ink on a piece of white paper is suitable for the vertical target.—E. Peter Smith.

Cork Labeled. A coat of cellulose cement spread over an ink label on the cork is a handy way of identifying solutions. The cement prevents the ink from being smeared or rubbed off.—J. Wilson.

New Camera Is Compact. Although smaller than the hand, a 35-mm. camera introduced by the Bolsey Corporation of America, New York, uses standard 35-mm. film cartridges. Equipped with an f/3.2 coated 44-mm. lens, a shutter with speeds up to 1/200th sec., and a coupled rangefinder, it is priced at about $50.



Cushion Protects Glasses. Photographers who wear glasses and use eye-level finders are likely to chip one of the spectacle lenses by bringing the finder against it. On a camera of the above type, this can be avoided by cutting a rubber ring from the neck of a slip-on eraser and cementing it to the finder.—Herman Klein.

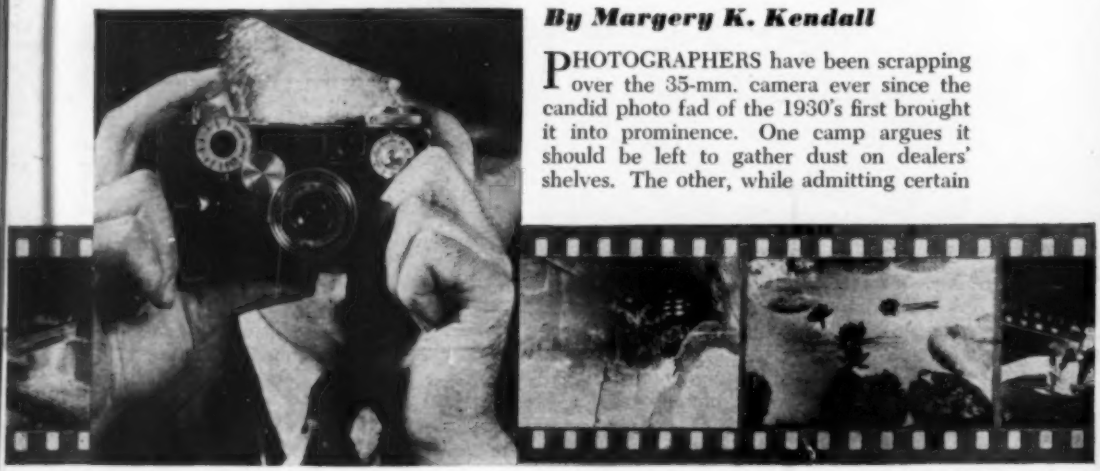


Enlargements of salon quality are possible, if you respect the limitations of the camera.

Your 35-mm. Camera Challenges Your Skill

By Margery K. Kendall

PHOTOGRAPHERS have been scrapping over the 35-mm. camera ever since the candid photo fad of the 1930's first brought it into prominence. One camp argues it should be left to gather dust on dealers' shelves. The other, while admitting certain



Composition should begin, and end, in the viewfinder; that is, put the full negative to work.

limitations, contends that it will produce topnotch work if properly used.

I belong to the latter group, and I'd like to say my say on the subject. As an example of the work the camera will do, I submit the photos that accompany this article. All have been blown up successfully to 11" by 14".

You should understand first of all that any good 35-mm. camera is a precision instrument. (We're talking here of the Leica type, not the many inexpensive, fixed-focus imitations.) Unless operated with the precision with which it was made, the miniature camera never will give good results—

Excellent candid shots of people are a cinch.

Backlighting and good composition give this a punch.

the beginner who really wants to become a serious photographer and turn out prints of salon quality, there's nothing better than a 35-mm. camera.

Do I hear a clamor up there in the peanut gallery? Sure, I'm aware of the heresy I've just expressed. I know as well as the next one that the beginner usually is advised to learn all about a simple camera before graduating to anything as intricate as a Leica or Contax. But I disagree.

The miniature camera will not tolerate slipshod work. It demands your best. If you try to cut some of the corners that a simple camera may allow, sure as blazes you'll trip over your own shutter button and come up with nothing more than a fist full of useless negatives. But if you respond to the challenge that the camera presents, you'll find yourself learning. If you master the camera, you'll be well on your way to becoming a competent photographer. If you don't—well, perhaps you weren't cut out to be a photographer anyway.

except by accident. If you shoot it the way a Sunday snapshooter does a box camera, you'll get just about the same kind of pictures, or worse.

In this demand for precise use lies a point in favor of the 35-mm. camera; for

Even those photographers who are always knocking the miniature camera will usually agree there are times when its short focal length and fast lens are assets. In a theater, for instance, a 35-mm. camera often

Closeups like this water-lily shot are as much in the range of the camera as are landscapes.

Camera movement is always fatal. To get sharp photos, use a tripod or a similar support.

can catch a scene under adverse lighting conditions that might cause another camera to fail. And there is no denying that the small camera is inexpensive to operate, both for black-and-white and color. It's quite an advantage to be able to shoot a scene three or four times without worrying about film. For color slides, it can't be beat.

It is true that grain is the miniature-camera fan's worst foe, but this can be minimized by using fine-grain film and developer, and then enlarging on rough or matte paper. Cropping also should be done in the viewfinder, rather than in the enlarger, for a piece of film the size of a postage stamp is small enough without making it smaller by using only a part of a negative.

Always use a tripod for exposures longer than 1/25th sec. When a large negative is blurred by camera movement, you usually can make an acceptable contact print. With a 35-mm. camera, you're out of luck. END

Everything's in focus here—the people in the foreground and the planes in the distance.

Pocket Radio Doubles as Hearing Aid

By Albert Rowley

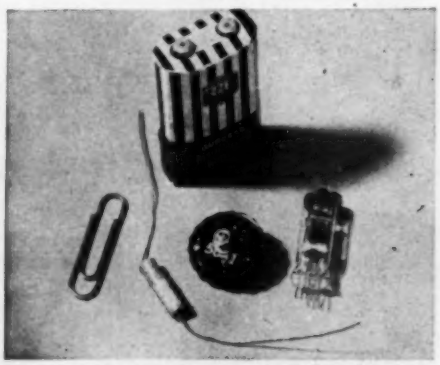
GUIDED by wartime needs and the ingenuity of parts designers, electronic components are getting to be so tiny that even electrons may soon feel cramped. Elsewhere in this issue you can see what manufacturers have in store in the way of miniature radios, hearing aids, and the like. For the experimenter who must work with standard parts, much of this is still out of reach. But if you can't quite compete with mass-production techniques, you can come pretty close with some of the pint-size parts that are now available.

The pocket radio and hearing aid described in these pages uses only four subminiature tubes in a dual circuit arrangement. When the switches are in one position, all four are incorporated in a superheterodyne receiver. With two of the switches reversed, three tubes form a sensitive audio amplifier.

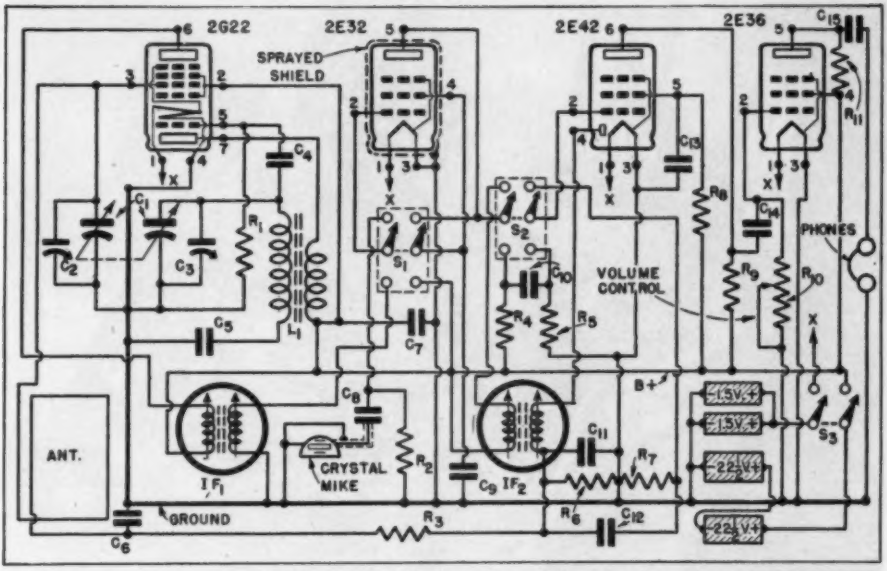
In the radio circuit the 2G22 acts as a

A crystal cartridge, together with its rubber cushion, is removed from a microphone housing.

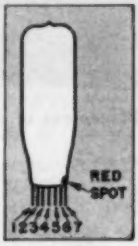
Cut a hole that will make a press fit for the rubber lip and cement the cartridge in place.



A few of the tiny components. Note the small condenser, volume control, tube, and battery.



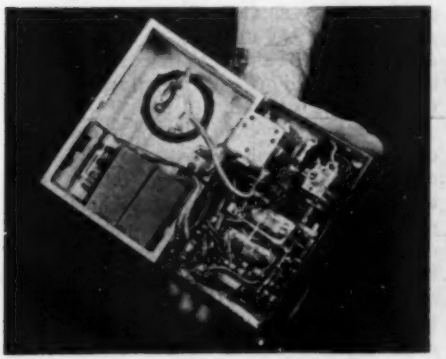
Tube-pin numbers are counted from the left when the red dot is at the right.



triode-heptode frequency converter; it is replaced by the microphone in the hearing-aid application. A shielded pentode RF amplifier, the 2E32 is used alternately as IF amplifier and first-audio tube. Next comes the 2E42, a diode-pentode which doubles as second detector and second audio amplifier. The 2E36 pentode is the output amplifier in both applications.

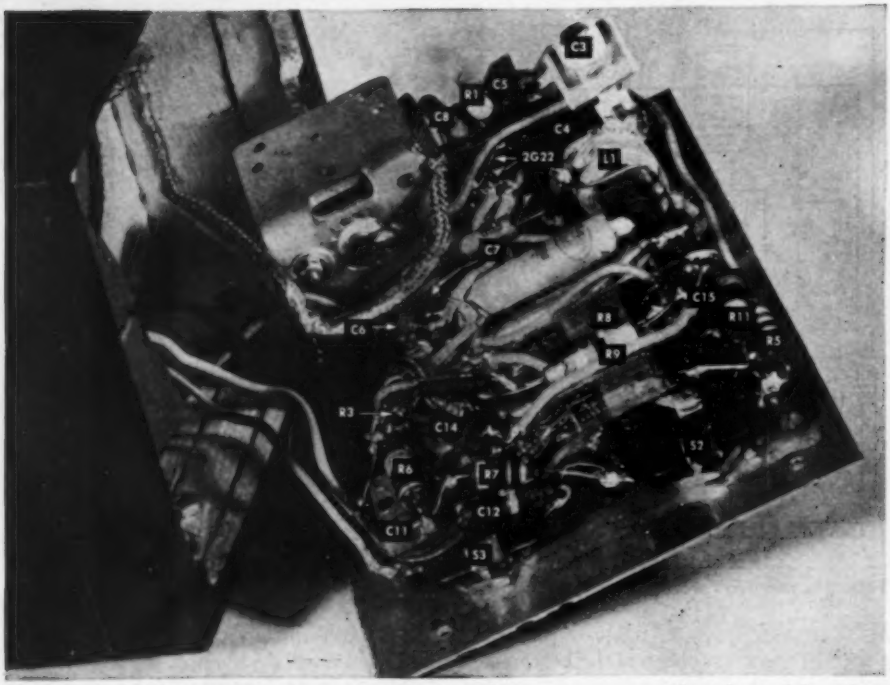
Proper assistance for the hard of hearing is something that may require the individual attention of a physician as well as the electronic designer. No attempt has been made here to correct for varying conditions of deafness. All this hearing aid will do is amplify sounds at the microphone so that they reach the ear with far greater intensity. Many persons who are hard of hearing can use this instrument with advantage as an auxiliary—not as a substitute—for an expertly fitted device.

For those with normal hearing who fancy a pocket-size radio without the extra feature, it is a simple matter to omit the microphone and switches S1 and S2, making the



Interior of completed set. All parts except batteries, mike, and C2 are on the front panel.

Opened out, front and back look as above. Controls are on the front, mike on the back.



Placement of the parts is important for reasons of space economy rather than of function.

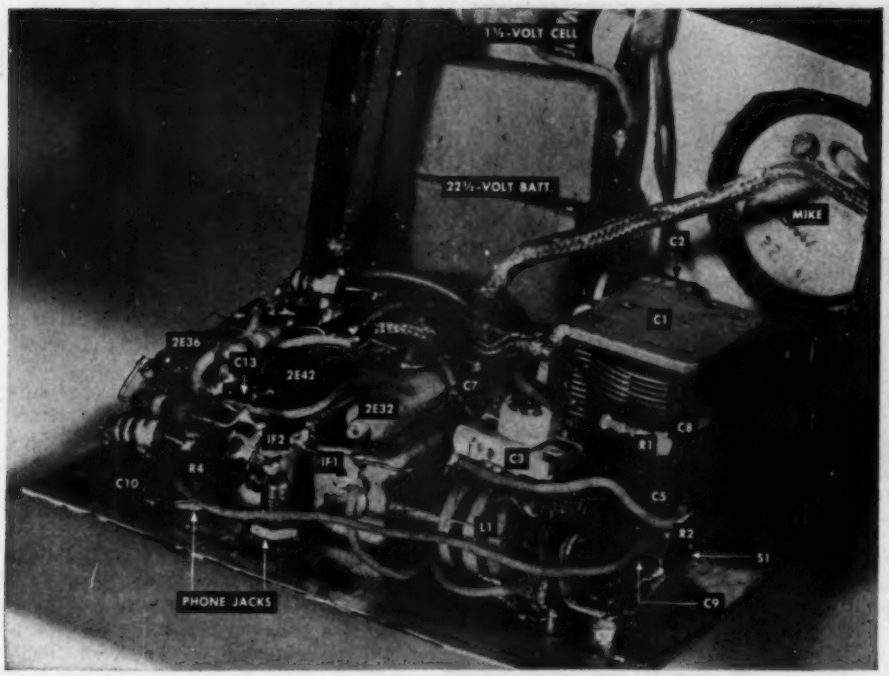
connections permanently in the radio position. The associated resistors and condensers can also be left out, thus making it possible to reduce the size of the case below the 1⅞″ by 3¾″ by 5¼″ box needed to house the present components.

Two 1.5-volt penlight cells in parallel supply the filament voltage for the tubes. As these must be changed quite often, a clip bent from aluminum or other metal should be used to permit easy insertion of replacements. The pair of 22.5-volt batteries that furnish the 45 volts of B-plus last longer and can be soldered in. Other miniature parts used in this set include paper tubular condensers about the size of a ½-watt resistor, IF-transformer cans ⅝″ square, and a volume control in which the carbonized element is contained inside the tiny knob.

A loop antenna consisting of 30 turns of No. 28 enameled wire is wound around the case and held in place by a layer of cloth tape. One side of the loop is connected to pin 3 of the 2G22 converter and to the antenna section of the two-gang tuning condenser, C1. The other side of the loop goes to the chassis through a condenser. The incoming signal is mixed with a frequency generated by the oscillator circuit to create an intermediate frequency of 456 kc. This is amplified by the 2E32 IF tube. Coupling between the converter, IF, and second-detector stages is accomplished by the IF transformers.

The larger of the two oscillator-coil windings is connected in series with C5, a .0004-mfd. fixed mica condenser that acts as a padder. This condenser, plus the proper adjustment of the iron core of the oscillator coil, permits this circuit to track at the proper frequency above that to which the antenna circuit is tuned.

Two midget IF transformers, mounted in cans measuring only ⅝″ square by 2″ long, are fastened directly to the chassis—which is the reverse side of the front panel—by means of small machine screws. Like the oscillator coil, the IF transformers are tuned by adjustable iron cores. Since the tuning of these transformers is extremely broad, it is not necessary to use a signal generator in aligning the set. Once a station is tuned in, the cores can be adjusted by ear to maximum volume.



The general layout shown is recommended; if you must vary it, plan your changes carefully.

To get all the necessary parts into the small space allowed, it is important that you plan the layout with care. The photographs indicate the location selected for most of the items; where you deviate from this it is a good idea to try out the major units before making permanent connections.

Another consideration in building this set is that some of the components are placed directly on top of others. It is therefore necessary to complete all soldering on the first layer before placing the next one on top. Switch S1, for example, is mounted between C1 and the oscillator coil, and wiring to it must be completed before the 2G22 is placed above it. The same holds true for the volume control, R10, since the oscillator coil and padder condenser are mounted on top of it. Wiring to the other two switches must be completed before the 2E36 is put in place.

Since they are so small and light, no sock-

LIST OF PARTS

C1: Two-gang midget tuning condenser, .00036 mfd. each section.
C2, C3: 0 to 50-mmf. trimmers.
C4: .0002-mfd. mica.
C5: .0004-mfd. mica (used as padder).
C6, C7, C8, C9, C10, C12, C13, C14, C15: .005-mfd. paper tubular, very small.
C11: .0001-mfd. mica.
R1: 100,000-ohm, ¼-watt carbon.
R2, R9: ½-meg., ¼-watt carbon.
R3, R5, R6, R7, R8: 1-meg., ¼-watt carbon.
R4: 200,000-ohm, ¼-watt carbon.
R10: hearing-aid volume control (carbon element enclosed in knob) ½ meg.
R11: 40,000-ohm, ¼-watt carbon.
Ant: 30 turns No. 28 enameled wire wound around case.
IF1, IF2: Iron-core 456-kc. IF trans. mounted in cans ⅝" square.
L1: Adjustable iron-core oscillator coil.
S1, S2: DPDT toggle.
S3: DPST toggle.
Crystal microphone (lapel type, or cartridge removed from housing); headphones (crystal or magnetic); four subminiature tubes (one each, 2G22, 2E32, 2E42, 2E36); penlight A cells, miniature 22½-volt batteries, misc. hardware.

One of the newer pen-size soldering irons is almost essential for work on this midget set.

ets are required for the tubes. They are held in position by strips of cellulose tape plus the soldered connections to the pins.

A high-impedance lapel microphone would probably be most satisfactory for use in the hearing-aid portion of this set, but a very suitable—and much less expensive—substitute can be found inside an ordinary crystal-mike housing. The photos show how the cartridge was removed from its bullet-like shell and fastened inside a hole in one side of the box that holds the set. The rubber cushion around the crystal unit must be left on to protect the microphone from vibration. It is fastened with rubber cement.

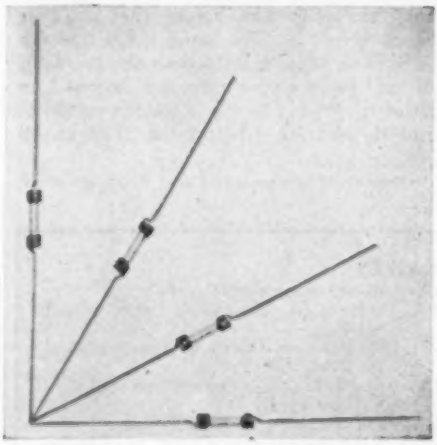
For other applications you may find it more desirable to keep the mike entirely separate so that it can be placed in a desk stand or worn on the clothing. Either way, the cable should be shielded.

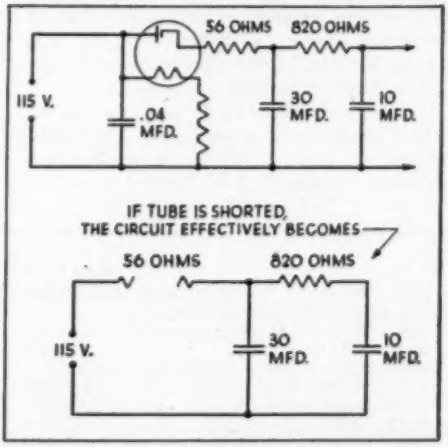
At the other end of the circuit, ordinary high-impedance headphones of the crystal or magnetic type may be used. A single phone gives adequate results.

While there is nothing intrinsically difficult about the construction of this set, it cannot be built to size unless you are careful to obtain the very smallest parts. Also, it will take all your skill and experience with a soldering iron and the best workmanship you can put into it.

To make the unit completely self-contained, the external antenna and ground are omitted in favor of the case-wound loop. An antenna coil and aerial can be substituted if the conditions of use permit. Pick-up will, of course, be improved. Using only the loop shown, however, stations as far off as 400 miles were brought in clearly. END

New Wire-Wound Resistors Open up on Overloads





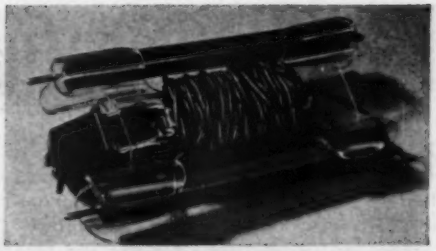
FUNCTIONING as an ordinary resistor at low power levels, a fuse resistor developed by International Resistance Co., Philadelphia, opens a circuit in the event of a short or overload. The diagram illustrates one function in the rectifier circuit of an AC-DC receiver. If the tube shorts, the line voltage will open the 56-ohm fuse resistor, thus reducing danger of fire and protecting the electrolytic condenser.

NEWS IN ELECTRONICS

Player Polarizes Itself on DC. A portable transcription player, designed principally for use in the field by radio and advertising men, features an AC-DC amplifier in which polarity does not have to be checked for use on direct current. It plays recordings up to 16″ in diameter at either 33⅓ or 78 r.p.m.

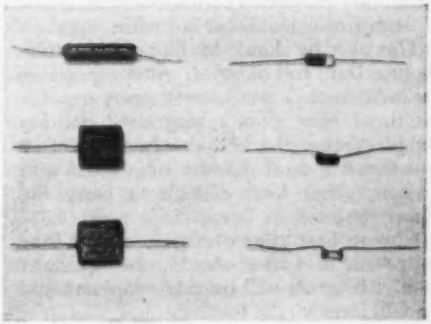
Automatic switching from AC to DC is accomplished by means of two DC relays. One relay diverts DC through a converter to the motor; the second, in conjunction with a selenium rectifier, adjusts the polarity to the amplifier. If the polarity is correct, the rectifier does not conduct, and the relay remains inoperative. If polarity is incorrect, the rectifier becomes conductive, closing the relay and reversing polarity. The unit is made by U. S. Recording Company, Washington, D. C., and is priced at $140.

Ceramic Capacitors. Developed during the war, ceramic condensers are being used interchangeably with both the paper and mica types in many applications. They are smaller than either and slightly cheaper than mica. Electrical Reactance Corp., Franklinville, N. Y. makes a range from 5 mmf. to about .02 mfd. in both a general-purpose and a temperature-controlled type. The latter is held to 1-percent accuracy. In the left-hand column of the photo are a .001-mfd. paper, and a .0005 and .00025 mica with equivalent ceramics.



Neon Tester Shows Continuity. The glow lamp in one of the prods of this tester indicates the presence of medium and high voltages in the usual way. It also checks electrical continuity. Star Fuse Co., New York, is the maker.

Signal Generator Is Hand Size. To help servicemen test and align receivers away from the shop, Clippard Instrument Laboratory Inc., Cincinnati, makes this midget multivibrator. Its signal, modulated by the 60-cycle supply, operates at a fundamental frequency of 2.5 kc., and is said to have usable harmonics up to 20 mc.



How Evaporation Steals Heat

EVERY time a liquid evaporates into a gas, it snatches a definite amount of heat from its container and surrounding air, cooling both below their original temperatures.

This law of physical chemistry has long been useful to the human race as a means of cooling foods or drinks. Primitive man found that water placed in unglazed earthenware vessels would seep through the pores, evaporate, and cool the water remaining inside. Campers and country dwellers still cool water in this way.

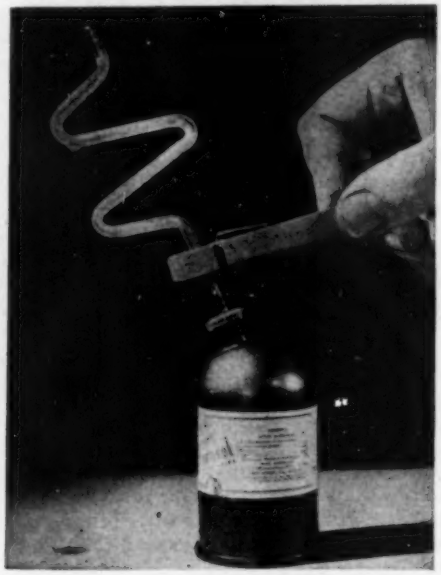
Today, all our mechanical refrigerators, electric and gas alike, harness the cooling effect of evaporation. Alternately compressed into a liquid and allowed to expand into a gas, the refrigerant absorbs heat during each evaporation cycle.

The following experiments demonstrate how evaporation lowers temperatures.

Ether Freezes Water. Since some liquids vaporize at a lower temperature than water, they produce a correspondingly greater degree of cold. Ether is such a liquid.

This may be shown by filling a test tube about a third full of ether. After equipping the tube with a two-hole stopper, insert a length of bent glass tubing until one leg almost reaches the bottom. Into the other hole thrust a short delivery tube fitted with rubber tubing long enough to carry the ether vapor out an open window.

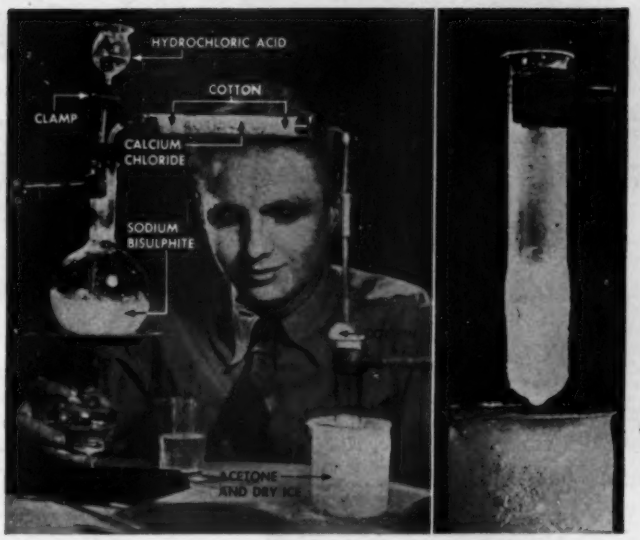
Now moisten the outside of the test tube with water and blow steadily into the inlet tube. The ether will quickly evaporate and ice will form on the test tube.



Insecticide Produces Frost. Some liquids evaporate at temperatures even lower than ether. An example is dichlorodifluoromethane, a liquified gas used for refrigeration and in insecticide bombs.

With such a bomb, you can easily see what spontaneous evaporation of this chemical will do. Hold the end of a glass tube, bent into a coil or zigzag shape, to the nozzle while the bomb is in action. (Be sure you hold the tubing with a pair of tongs or a spring clothespin, for any liquid accidentally sprayed on your fingers might freeze them). Evaporating and expanding as it escapes through the tube, the chemical quickly causes frost to form on the outside.

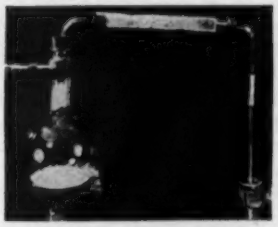
Liquefying a Gas. In an electric refrigerator, a motor-driven compressor liquefies a refrigerant gas, such as sulphur dioxide, by squeezing it powerfully. For purposes of experimentation, you can liquefy this gas by subjecting it to intense cold.

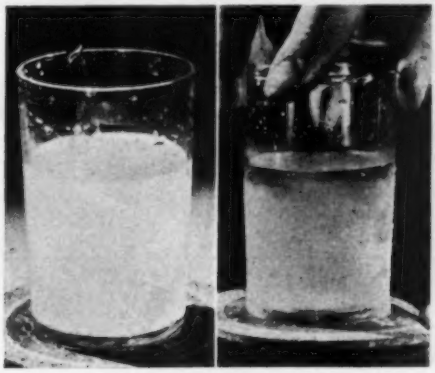


To generate the gas, put 15 grams of sodium bisulphite into a flask arranged, as at the right, with dilute hydrochloric acid (1 part acid to 2 parts water) in a dropping funnel above it. To dry the gas, fill the horizontal tube with lumps of calcium chloride, packing cotton loosely in each end before inserting stoppers with entry and exit tubes. Lead the latter into a large test tube supported in a freezing mixture made by filling the beaker half full of acetone and adding dry ice slowly. (Caution: keep your fingers away from the mixture.) Now open the clamp, allowing acid to fall drop by drop, and apply gentle heat.

When a quantity of liquid sulphur dioxide has collected, lift the test tube from the freezing mixture in a well-ventilated room. The liquid will quickly evaporate, forming frost as at the right above.

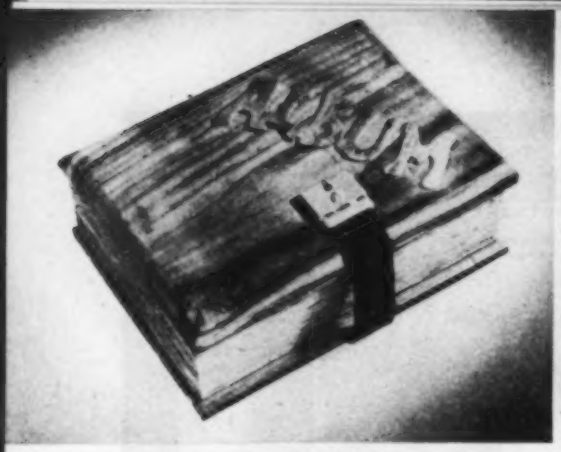
Gas Refrigerator Uses Ammonia. Altered as at the right, the apparatus will generate and liquefy ammonia, the refrigerant found in gas refrigerators. Put in the flask a dry mixture of 15 grams ammonium chloride and 30 grams of calcium hydroxide, insert a one-hole stopper, and in the drying tube place a loose layer of calcium oxide. Omit the hydrochloric acid; gentle heat will start the reaction. When some liquid ammonia has collected, remove the test tube from the freezing mixture. Again, frost will form.

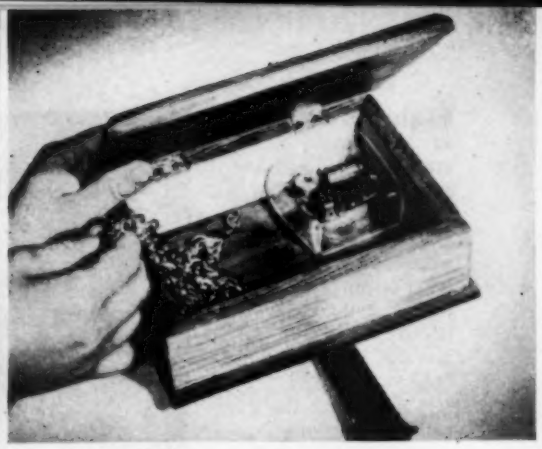


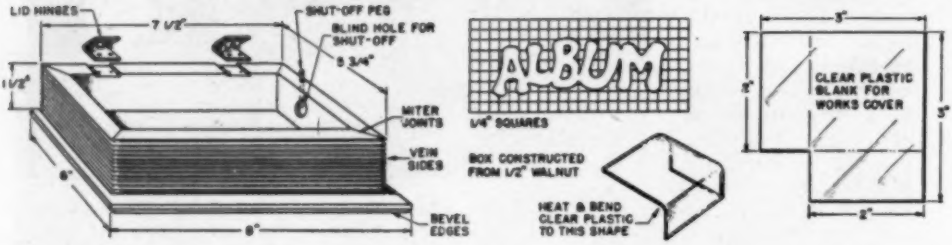


Chemicals Produce Cold. A few ounces of ammonium nitrate crystals will show that cold also may be produced chemically—merely by dissolving certain substances in water. A commercial device for cooling bottled beverages on picnics makes use of this principle.

To demonstrate how it works, put a few drops of water on a block of wood or a cork coaster and set a thin-bottomed glass on the water. Then put equal amounts of cold water and ammonium nitrate into the glass and stir rapidly. The coaster will freeze to the bottom of the glass. In dissolving, the chemical absorbs heat from its surroundings.







Album Jewel Box Has Hidden Music Movement

REMEMBER Grandma's old red-plush photograph album? If you do, this jewel box may strike a nostalgic note—and a tinkly tune as well, for it has a music-box movement. Housed under clear plastic, the movement can be seen as well as heard.

Ideally the lid and bottom of the box should be ½" walnut or other hardwood that can be nicely finished. Bevel all edges of both to give the appearance of a padded cover. The word "album" is cut from walnut veneer and glued on. Make the box frame of four pieces, with miter joints. Vein the two ends and the front with a wood-carver's veining tool, sharp chisel, or even a sharp awl to resemble pages of thick paper.

Mount the works so that the shut-off wire enters a blind hole in one end. Drill a hole for a small dowel, which will press down the wire when the lid is closed. Rout a recess in the bottom to accommodate the winding key. Cut a 3" square of clear plastic as shown and shape it over a 2" by 2" wooden block after softening it in the oven. Three brads driven into the box will hold it in place.

The strap and lock clasp came from an old diary and a man's leather belt respectively. Stain and wax the cover, and gild the sides to simulate gilded album edges.

Electric Shaver Converted to Power Eraser

DRAFTSMEN and others who do a lot of drawing will find an electric eraser a timesaver. Mine was made from an old electric shaver of the rotating-shaft (not the vibrator) type.

Clean and adjust the mechanism if necessary to make the motor run as fast as possible. Then replace the cover, remove the head, and cut or grind off the shoulders of the housing that form the cutter-head slot. Also grind off the cam at the end of the shaft that actuated the cutter. Solder a sleeve on the shaft (mine consisted of two dry-cell nuts reamed out to fit) and on it push a slip-on cap eraser. Point it by running the motor and holding the eraser against sandpaper or a grinding wheel.—F. W. ATWOOD.

Wallpapering Your Floor

By Julia G. Barkley
Photos by Dean Babcock

FLOORS get stepped on in more ways than one. Not only do we walk all over them, but we rarely take them into account in any decorating schemes. With half a chance, however, the floor can give a new lease on beauty to a commonplace entrance hall, dining alcove, or living room.

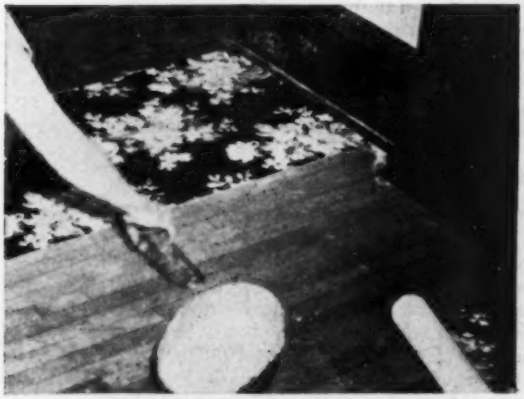
Probably the notion of walking on wallpaper strikes you as impractical. But with a good protective coating, paper makes a remarkably durable surface. In one public model home, such a floor was walked on by hundreds of people daily for five months without showing perceptible wear.

Choose a paper having a minimum of white in the pattern, since the protective coating may darken clear white. Next, make certain that the surface is flat and smooth. Cracks should be filled and sanded. It is then advisable to seal the surface with a preparatory coat of shellac.

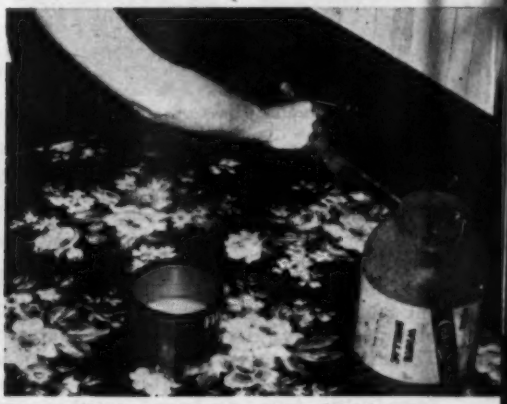
Select a tough-fibered paper and apply it with ordinary wallpaper paste. Match the stripes or designs carefully as you would on a wall. After the paste has dried, apply two coats of clear shellac and one of varnish. Allow each coat to dry before putting on the next. Protect the finished job with three coats of wax, buffed between applications.

Matched to the paper on the wall, the papered floor makes this hall look larger and brighter.

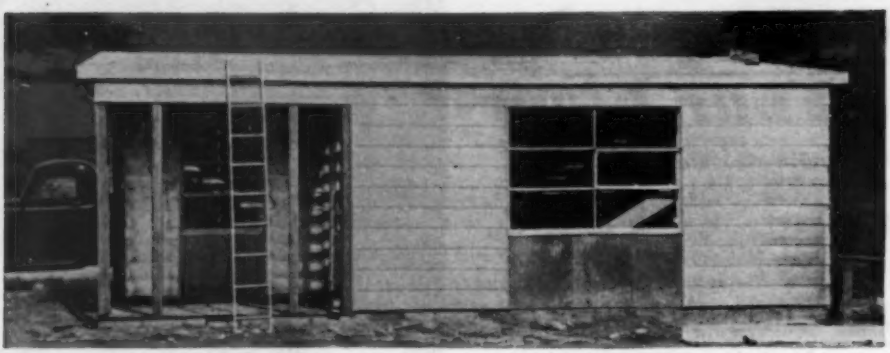
Fill in all cracks and irregularities in the floor, and sand the entire surface perfectly smooth.



Apply wallpaper paste to the floor and paper. Match the design carefully as you add strips.



To protect the paper, cover it with two coats of shellac, one of varnish, and three of wax.



Cabins Clad in Aluminum

Weatherproof sheet metal permits a low roof pitch. Joists and studs alike are set 24″ apart.

Cutting corrugated sheet on an 8″ table saw. Lightness makes it easy to handle and to set up.

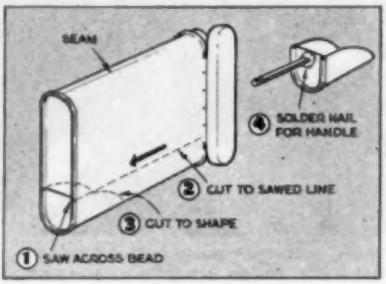
ONE way to beat certain material shortages in building is to use sheet aluminum for roofs and outer walls. Now plentiful, the metal is easy to fabricate on the site. It is being used on the West coast for vacation cottages as well as for emergency housing.

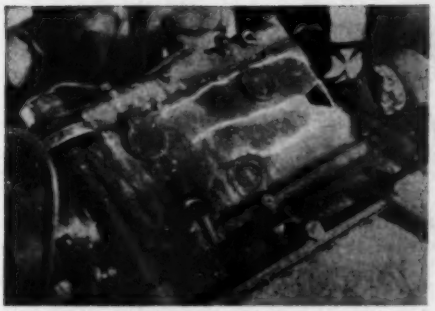
The chief types used in building small cottages like that shown above are 8″ clapboard-style siding and corrugated sheet for roof and trim, in thicknesses from .019″ to .027″. Standard channel sections are used for corner posts, eaves troughs, and downspouts. An 8″ aluminum-cutting circular saw and a cutoff saw do the entire job of trimming sheets to size on the spot.

Siding is nailed to two-by-fours spaced on 24″ centers, as are rafters and joists. Corrugated roofing is laid on 1″ by 4″ sheathing spaced 4″ apart. Building paper is placed under the aluminum to insulate the walls and to minimize drumming on the roof. Precut materials for a 24′ by 24′ cottage (above), exclusive of interior finishing, run $900 to $1,200. Built on a concrete slab, it has space for living room, bath, bedroom, kitchen nook, and closet.

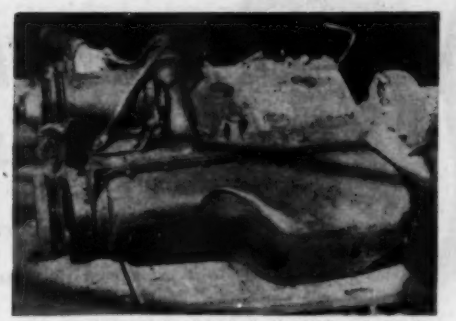
Midget Scoops from Tobacco Cans

FOR handling plaster-of-Paris, dry glues, and similar materials in the workshop, a tiny scoop is just the thing. You can make as many as you need from oval tobacco tins, and have a separate one for each purpose. With a fine-tooth hacksaw blade cut across the bead on the bottom first. Then use tin snips or heavy shears to cut along both sides of the can to the saw cut. Shape the scoop to the form you fancy, and then solder a nail to the back as a handle.—MAK CLEMENTS.





A piece had fallen out and there were 37" of cracks in the block at the beginning of the job.

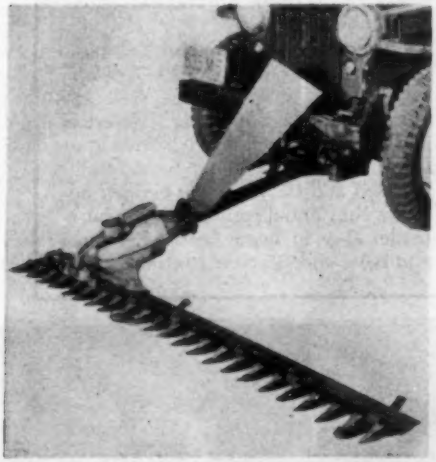


After welding, the block looked like this. The total time for the repair job was seven hours.

Badly Cracked Cylinder Block Saved by Welding

ALTHOUGH the cracked cylinder block above seemed a good candidate for the junk heap, a welding job made it as good as new. The job was done as a demonstration of welding at the Hobart Trade School, Troy, Ohio.

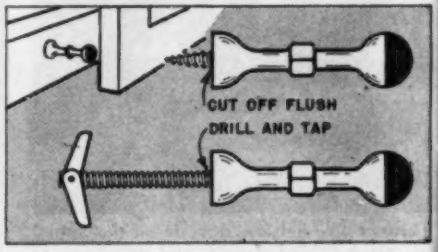
After thorough cleaning, the cracks were chipped to a ¼" V, and all sides of the loose piece were beveled to form a V with the sides of the opening. Welds were made from the start of the cracks toward the open end, and beads were kept short, between ½" and 1½" long. Peening was started the instant the deposited metal lost color, and welding was not resumed until the bare hand could be placed on the weld. When welding was complete, the beads were ground to remove surplus metal.



Mowing Bar Attached in Front

DESIGNED for use with a Jeep Ⓣ or four-wheel tractor, this grass cutting blade may be attached at the front of the vehicle.

Operated from the power takeoff, the cutter has a patented driving head that enables the operator to lock the 6' bar at any angle between horizontal and vertical without leaving his seat. The machine is a product of Turner of Indiana, Inc., Indianapolis.



Toggle Holds Loose Doorstop

IF YOU have trouble as I did in keeping a screw-in doorstop in place, the idea illustrated above will solve the problem.

Cut off the screw flush with the metal base of the stop, and drill and tap for a small toggle bolt from which you have removed the head. Then pass the bolt and toggle through a hole in the baseboard behind the door and turn it tight.—A. BURRIS.

Blowout Patch Useful as Tray

A LARGE blowout patch makes a fine sorting tray for the workshop. It may be spread out for easy examination and selection of small parts, and then can be squeezed into a funnel shape for pouring the parts back into their containers.—R. J. PAYANT.

HEB My Hobby Paid for Itself

By W. J. LaFleur

Monogram pins of carved applewood, turned out by semiproduction techniques, paid for this man's $1,000 shop. Here's how he did it.

1. Make experimental sketches on a small pad until you have a pleasing design, and ink in with a stylus pen and green ink. This gives good visibility to guide you on the jigsaw.

2. Cement the pattern directly on the applewood, using rubber cement, and drill holes in internal waste to admit the saw blade. Use a .020" blade with about 13 teeth to the inch.

Making money with a home workshop, an idea that has at one time or another appealed to most craftsmen, is an entirely practicable idea—as the thousands who have done so can testify. However, a word of caution is in order: we all differ in skill, determination, temperament, and other characteristics. Not everyone is fitted to earn money in his spare time. Some of us don't enjoy selling things, a vital part of the process. Others need the relaxation that only a pure, unadulterated hobby can give.

So craftsmen who are tempted to invest in special equipment to "tool up" for such an enterprise are well advised to make haste slowly. Materials cost, labor per unit, and advertising or distribution costs should be carefully assessed and *then actually verified* before a substantial capital investment is made. Try to begin with what tools you have and jigs you can make.

3. Saw the outline last and watch out for your fingertips. The saw foot should be set so the wood can be freely guided without any binding.

4. Sand off the pattern and smooth the front and back. A quick ride on first a 2/0 and then a 6/0 sanding belt will do the job speedily.

5. Drill the back for the pin and clasp. Make a gauge (right) with phono needles to get the proper spacing. A punch "signs" my work.

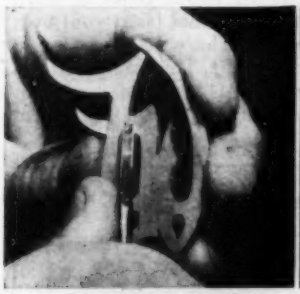
THIS is the story of my ten years' experience in earning money with my hobby—money that was in large part reinvested in my workshop. The fun and satisfaction that I gained remain as net profit that can never be lost; but the income has bought equipment to make my workshop better.

My product has been mainly one item—hand-carved applewood monograms of distinctive design. Two differences have set them apart from commercial competition: the individual design, which particularly appeals to women, and the pleasing qualities—the color and texture—of applewood. For equipment I use a jigsaw, belt sander, a few wood-carving chisels, and the two special tools shown on page 234. The total time required to make one pin is about one hour.

If you should be tempted to try a similar enterprise, let me first pass on a few pointers. First, do not plan to assemble sterotyped alphabet letters, which is the basic mistake of most monogram projects. You can make individual designs just about as easily, and their individuality is the secret of their appeal. The carving operation would be about the same in either case, so scant time would be saved.

Don't count on lumber yards for your supply of applewood. Several years' supply can be had from any farmer who cuts down an old tree. He will usually be open to some dickering for one or two 4′ logs. Take the logs to a saw mill and have them cut into rough planks about 2″ thick. When you get them home, resaw the planks into blocks about 2′ long and rip them into slats about ¼″ thick. They will dry quickly; some will warp but little wood will be lost.

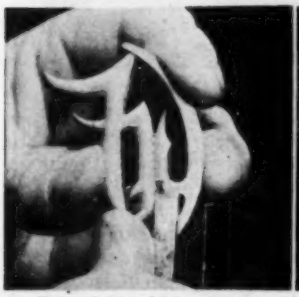
A wide variety of other hand-carved jewelry ideas will suggest themselves to you once you have worked this fine wood. It will take and hold the most exquisite detail. It needs no stain, for clear dull lacquer will bring out its full color. It can be carved against or across the grain almost as readily



6. Carving is done with the work hand-held; it is turned too often for vise clamping. Here a V-gouge is used in a push stroke between letters.

7. A flat chisel shaves down one part so it will seem to pierce a neighboring letter. The right thumb on the work guides and limits the stroke.

8. To shape fillets and to round members, a skew knife is handy. Note that a V-cut serves to separate the letters A and E in this piece.



9. Rounding the separation can be done with the flat chisel. The right thumb is again used as a stop on the short, accurate push cuts.

10. The skew knife may also be drawn toward the thumb in the conventional whittling manner. Extremely keen tools are safer and easier to use.

11. Eight pins and the tools that carved them. Note how the individual letters in the monograms seem to interweave or pierce each other.

12. Sanding strips whirled by a small motor remove carving marks and smooth the piece.

13. A large hypodermic needle on the cement tube inserts a daub inside each mounting hole.

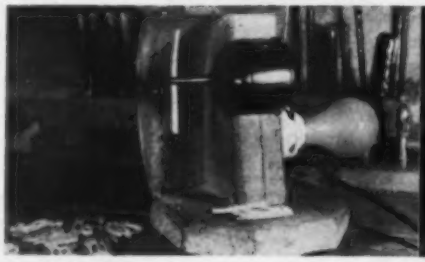
as with it. It does not easily split or splinter, and is strong, light, and a joy to work.

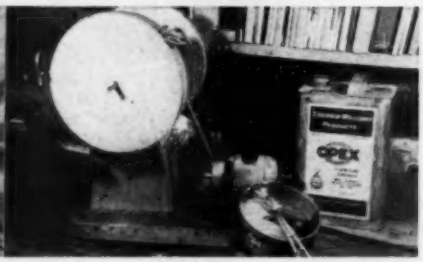
If you have not had much practice at carving, take especial pains to develop the short push stroke shown in several photographs. Although it feels awkward at first, it's worth learning, since it gives extreme accuracy of control. Hold the chisel or gouge so that the side of its blade slides along the pad of your thumb, which should be firmly pressed against the wood to protect against slips. Anchoring the thumb against the work this way guides the cutting edge and limits the length of strokes.

Clasp pins and safety catches can be purchased in quantity from jewelers' supply houses for a few cents apiece. I find that the best finish for the pins consists of two dip coats of dull furniture lacquer, with at least one hour between coats. Do not lacquer when the shop is damp or dusty.

For a professional touch, make or have made a marking punch that bears your own personal hallmark. (The writer's mark is a modified fleur-de-lis.) This signature on everything you make is a proper symbol of your pride of craftsmanship. END

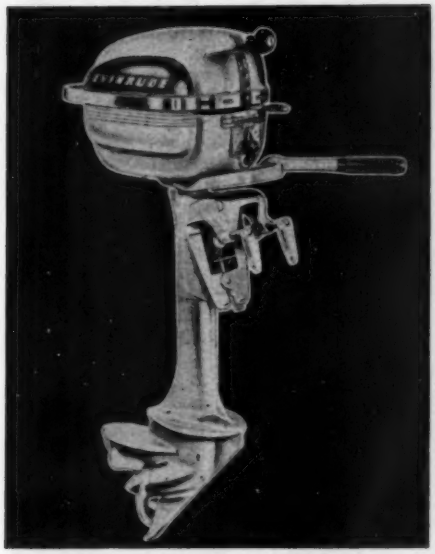
Sander and Lacquer Wheel Aid Production





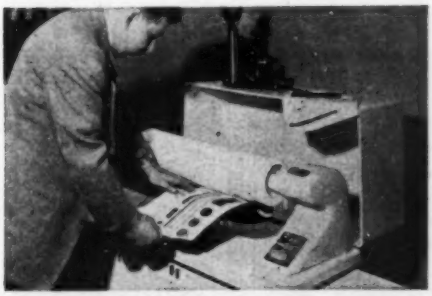
TWO shopmade tools that have greatly facilitated the making of carved monograms are the sander and drying wheel pictured above. The former is a small series-wound motor mounted on a standard and wired through a 100-watt bulb to prevent excessive speed. A saw cut at the end of the arbor on its shaft takes four thicknesses of dentists' sanding strips. When whirled at a moderate speed, they penetrate every nook on the carving and leave a satin finish.

The drying wheel permits the pins to be dipped in lacquer without risk of runs or fat edges. It consists of two 9" pine disks on a cross shaft belted to a motor with a reduction gear. The disks turn at about 12 r.p.m. and are a fairly loose fit on the shaft so they can be stopped to permit inserting a pin without stopping the motor. A pin is dipped in lacquer and stuck on the wheel. After about 15 minutes of slow movement through the air, it will have dried with an even coat.



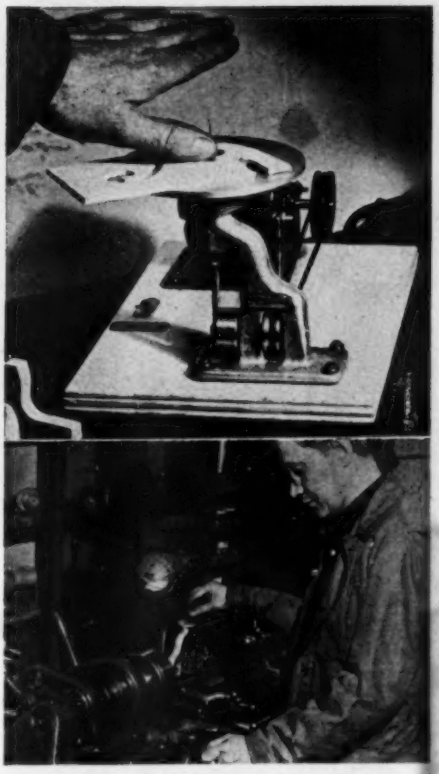
Outboard Has Fuel Gauge

In the new Evinrude "Sportwin" outboard motor, you don't have to open and close the fuel vent or shut-off, since the carburetor-adjustment lever performs these tasks automatically. Strikingly styled, the motor is of the twin-cylinder, alternate firing type, with improved carburetion. It is equipped with the Evinrude "weedless drive" lower housing and boasts a fuel gauge on the tank. Carrying grips are generously proportioned for easier handling.



Automatic Ironer Dries Photos

Photographs may be dried in about a minute by running them through an automatic ironer eight or ten times. If alternate ends are used, the ironer roll will dry between prints. The procedure is particularly convenient for photographs that are too large for the ordinary drier or blotter.



New Jigsaw Protects Fingers

Even if you hold a thumb directly against the blade of a new miniature throatless jigsaw developed by Al Norquist, of Seattle, Wash., the stroke is so short that it's practically impossible to cut yourself. Inventor Norquist, shown in the lower photo drilling bearings for the saw, spent four years perfecting the safety feature.

Because there is no suspending arm, the cutting platen will accept material of greater surface area than conventional small jigsaws. The blade, extending 2″ up through the 5″ cutting platform, will cut soft woods such as balsa up to 2″ in thickness and will handle ½″ six-ply waterproof plywood with a 1/25-hp. motor.

Cutting angles are virtually unlimited because of the tiny cutting blade and the freedom of placement of material on the throatless cutting platform. Especially suited for modelmaking, the saw performs notching jobs and saves tedious whittling of fittings and parts. Replacement blades are available for 5 cents each.

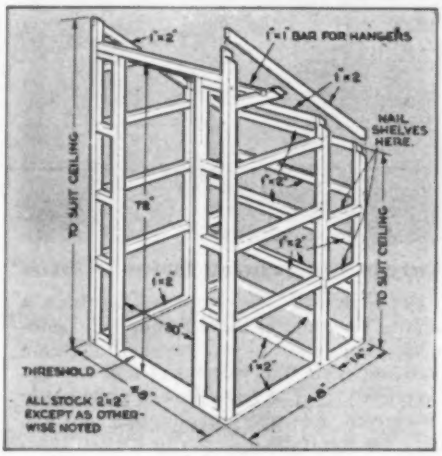
Closet Improves Attic

WITH house space at a premium, a finished attic deserves to be more than a mere storage place for trunks and old clothes. But no matter how well appointed, an attic bedroom is never really satisfactory until it has attained the dignity of having its own clothes closet. Here is a design that requires no fastening to wall or floor, and can therefore be moved up and down under the eaves to permit endless rearrangement of the furniture.

The front part of this closet—whose dimensions must be varied to suit the particular requirements of your attic—has enough height and depth to be really serviceable as a clothes closet. The normally wasted back part is made useful with storage shelves that can be reached from the side. Shelves are wide enough to hold duffel bags, small grips, and the like.

Construction details for the frame are suggested in the drawing. Locate the clothes pole or a 1″ by 1″ hanger bar approximately in the center of the closet space. Rear storage shelves are nailed to the 2″ by 2″ crosspieces as indicated. Standard threshold stock can be used across the door opening, or the piece may be shaped from a suitable length of 1″ by 3″ board butted against the uprights.

Side panels should be made of wood that is light in weight but also strong enough to add rigidity to the frame. Cedar paneling was used in the unit shown; plywood from ¼″ to ½″ in thickness would also serve. No top or back is needed since the closet is made to fit snugly against the wall and roof. Doors may be added to front and rear sections, or either or both can be left open as shown in the photos.—EDWARD R. LUCAS.



Ivy Holder Built Like Old Lantern

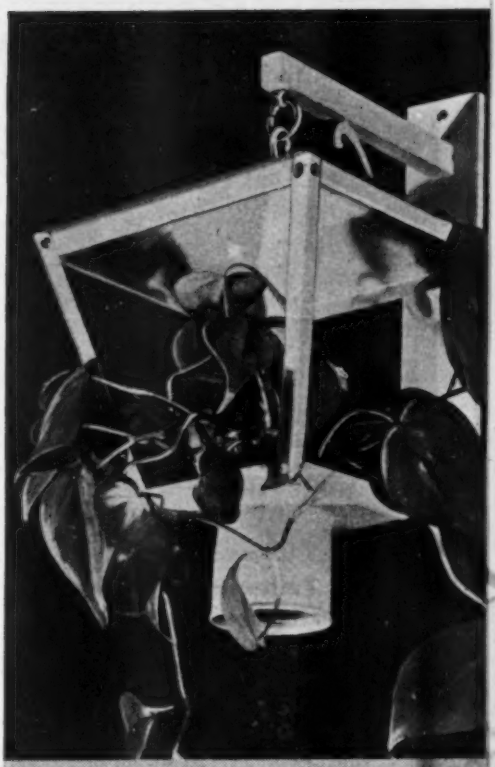
DESIGNED from an antique lantern, this ivy holder was cut and bent to shape from scraps of tin plate. For the bottom, lay out a 4¼″ square and inside this another measuring 3½″, leaving a ⅜″ margin. Measure back ¼″ each way from all corners of the outer square, connect with the corners of the inside square, and score the inside square with a metal scriber. Scribe a 2¼″ circle at the center.

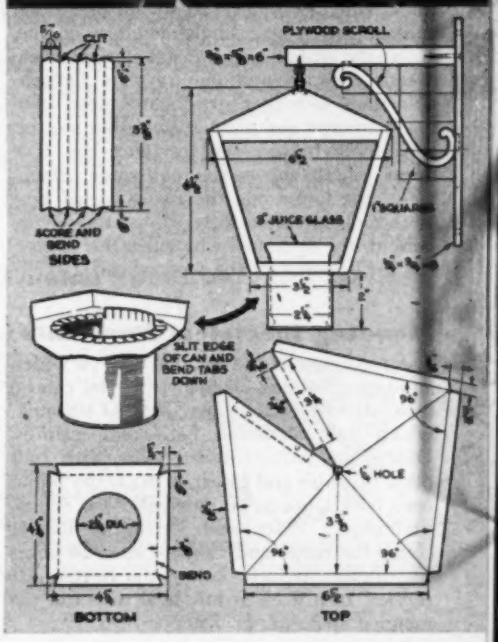
Then cut out the bottom—the circle, the outer square, and the V-shaped pieces at each corner—and bend up the edges along the inner lines. For the ivy-pot well, cut and install a tin can as indicated, anchoring the retaining tabs with solder.

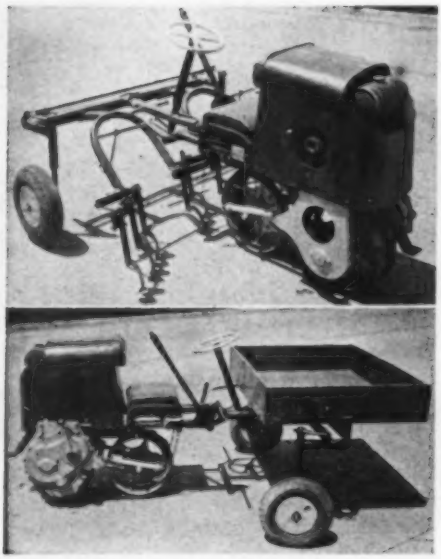
To make corner uprights, mark off adjoining strips 5/16″ wide and 5⅜″ long on a sheet of tin plate, lay out angled ends as seen in the drawing, score the corner lines, and cut the strips apart. For ease in bending, clamp one side of each leg between two pieces of wood or place it in the jaws of a large woodworking vise.

In laying out the top, begin by marking off a 6½″ line. From its center, erect a perpendicular, measure up 3⅜″, indent with a center punch, and scribe bending lines between this point and the ends of the base. With a protractor now lay out lines from either end of the base at an angle of 96 deg., measure off 6½″ on each, connect with the center point, and establish the fourth side in the same way. After marking off a ⅜″ margin on each side, mark one corner by measuring back 7/16″ as seen in the drawing, and then use a bevel gauge to lay out the others. Before cutting out, drill a ¼″ hole at the center. Assemble with rivets or small bolts and nuts.

The bracket consists of three wood members, a ¼″ by ¾″ by 8″ back with a ⅜″ by ⅝″ by 6″ arm supported by a plywood scroll. Form a narrow U from stiff wire, force the legs through the hole in the lantern top, cross them inside, and bend up against the top. Wire this loop to a screweye in the crane, and the job is complete. Paint the lantern as desired.—JOHN J. GALLIVAN.







Garden Tractor Uses Crawler

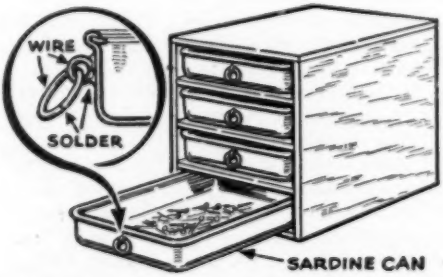
THE economy of small-tractor operation is combined with the efficiency and power advantage of crawler tracks in this new rear-engine tractor being marketed by King Equipment Company, Skokie, Ill. Traction is obtained through a 6″ treaded rubber track which provides 120 sq. in. of ground contact. A 4-hp. single-cylinder engine, automatic clutch, and transmission give two speeds forward and one reverse. Detachable tools include a moldboard plow, two-row cultivator and planter, sickle bar mower, spike-tooth harrow, and carrying box. The upper photo shows the cultivator attachment, the lower one the two-wheeled box. With tools mounted forward and the engine behind, the operator, who rides the tractor, has a clear view of the work ahead.

Mending Electrical Porcelain

A FRACTURE in the ceramic base on which an electric heating element is wound can be repaired with water glass (sodium silicate), which will withstand high temperatures. Dilute one part of water glass with four parts of water and brush or drain the liquid onto both faces to be mended. One or two preliminary coats add strength. Tie or clamp the edges and allow at least 24 hours for drying. Before putting the heater into service, turn it on at low heat to warm the mended spot.—H. D. KELLOGG.

Model-Plane Noise Is Muffled

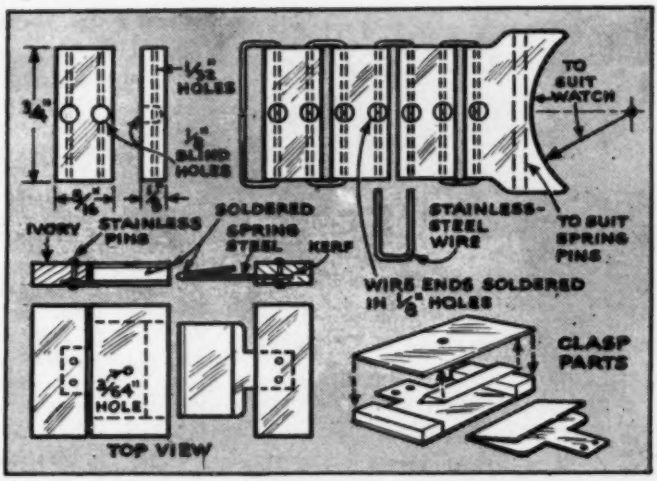
WHEN his fellow townsmen objected to the noise of his young son's model airplane, Marty Johannes, of Burbank, Calif., designed the muffler for model gas engines he is shown holding above. Made of aluminum, the 10″ long muffler weighs but 3½ oz. Beyond 100′, no noise can be heard from models equipped with the device; at closer range engine roar is said to be sharply reduced.



Sardine Cans Hold Small Parts

STORAGE drawers for nuts, washers, and other small hardware can be made from a few sardine cans on which the sharp edges have been turned down. Wire loops are soldered to the face of the cans for drawer pulls. Plywood, composition board, or any similar material can be used to assemble the shelves and outer walls, and of course you can group any number in the most suitable arrangement.—CLIFFORD LAWRENCE.

Watch Bracelet Made in Ivory



HAVING acquired some walrus tusks during my service sojourn with the Eskimos, I made them into a wrist-watch bracelet. Ivory isn't common, to be sure, but the construction can be adapted to plastic or fine-grained hardwood.

Link blocks are cut ¾" by 5/16" by ¾", and then filed, polished, and drilled as shown. They are connected by U-shaped pieces of stainless-steel wire soldered together in blind holes on the inside of each block.

As show in the details, the spring-steel clasp parts are soldered together. Both socket and tongue are riveted to the end blocks. To open the clasp the catch is depressed by inserting a pencil or other point through the 3/64" hole in the cover piece of the socket.—EDWARD A. ZAFIAN.

Umbrella Shades Tractor Seat

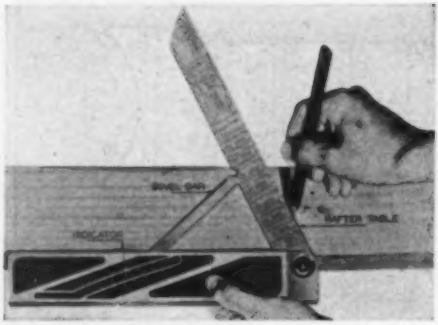
NEITHER sun nor rain can get at the operator of a tractor equipped with one of these adjustable umbrellas. It can be raised, turned, or tilted to come between the sun and the operator as the tractor moves across the field or the sun moves across the sky. A 54" canvas shade is attached to the all-steel frame. The Snow Corporation, Omaha, Nebr., is the manufacturer of this farmer's friend.

Opening Joints in Soil Pipes

IN REMODELING or repairing drainage facilities, it is frequently necessary to insert a Y or remove a section of cast-iron pipe. One practical method of opening a run of soil pipe is to cut through it with a cold chisel just above a convenient joint. Loosen the remaining joints by twisting the pipe. If heat must be applied, use a blowtorch. To remove a long stretch, it is easiest to use the blowtorch on every second joint, the intermediate joints being melted on an open fire.—J. MODROCH.

Wooden Spool Grinds Plastics

A LIGHT-DUTY grinding and smoothing wheel for plastics can be made from an ordinary wooden spool. Mount it tightly on a motor shaft, polishing head, or lathe, enlarging the hole if necessary. A countersunk machine screw driven into a drilled hole acts as a setscrew. Used without abrasive paper, the spool will smooth or round edges.—FRANK SHORE.



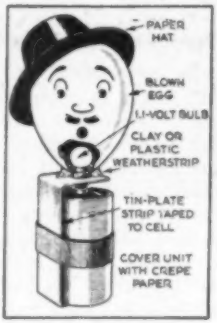
Framing Square Is Set to Pitch

ONCE this new tool is set to the pitch of a roof, it automatically gives the correct marking angles for jack rafters, hip and valley rafters, and similar framing parts. A degree scale is also provided to lay out work for power-saw cuts. Made by Lloyd Crowley, of Salem, Ore., it costs about $11. When folded, it measures only 2" by 12".

Wire Clip Melted into Plastic

ALTHOUGH cement is commonly used to attach clasps and pocket clips to plastic jewelry and lapel pins, it often gives an insecure bond. It's better to use the heat-sensitive quality of plastic to anchor the fastening. Heat the end of the clasp with a soldering iron, force it into place, and let it stay without movement until the plastic rehardens. Don't heat a tempered steel clip in a flame since it might lose its springiness if it became overheated.—M. B. HOBBS.

Egg Favor Is Lighted by Bulb



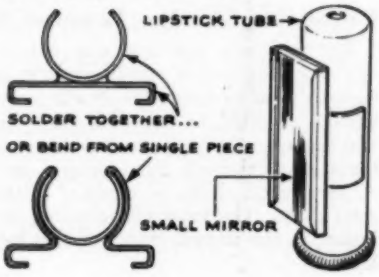
WITH a flashlight bulb inside a blown egg, this Easter table favor makes an unusual party decoration. Break away just enough of the shell to clear the bulb, which is turned into a snug hole in a C-shaped tin-plate strip. Modelling clay or weather-stripping seals the juncture. Draw the face with India ink or water colors, and add crepe-paper clothing. Turn it off or on by bending the lower contact.

Car Back Seat Forms Play Pen

DESIGNED for easy installation between the back windows of any sedan, a new accessory made by the Aller Manufacturing Company, of Chicago, converts a rear auto seat into a combined play pen and baby bed. Its retail price is about $6.

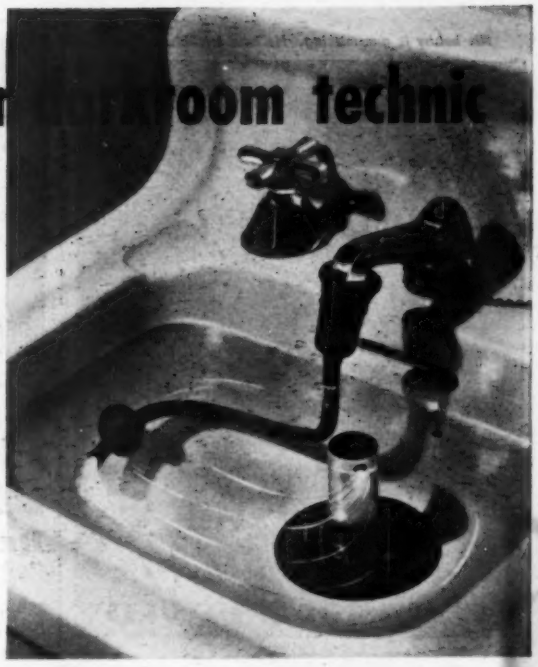
Small Mirror Is Clipped Around Lipstick Case

THE weaker sex, always partial to mirrors, seems particularly fond of this one, which consists of a tiny rectangular mirror in a brass clip shaped to fit a lipstick. Being detachable, it can be quickly transferred to a new lipstick when the old one is used up. Make it of thin, springy brass, either soldering the semicircular clip to the mirror frame or bending frame and clip from a single piece. Use abrasive cloth to soften all sharp edges, buff to a high luster, and lacquer. Then slide the mirror in place.—T. P. ILARI.



Improve your darkroom technic

with these inexpensive KODAK AIDS...



KODAK WASHING ASSEMBLY . . . converts your home sink into a circulating washer . . . washes negatives and prints. Fresh water enters sink from faucet through a hose, which can be affixed to side of sink by means of a vacuum cup. This insures desired circulation and thorough washing. Water drains out through adjustable stopper over sink drain. Price, $2.25.

KODAK COMBINATION FUNNEL. . . helps you pour solutions without wasteful spilling. Easy to clean. Made in two sections which can be used singly or in combination, providing 3 sizes of funnels. Large section has maximum diameter of 5 inches, and 2-inch spout. Small section fits over spout of large section and terminates in ½-inch spout. Price, 85 cents.

KODAK DARKROOM THERMOMETER. . . provides accurate temperature readings from 0° to 120° Fahrenheit in 2° calibrations . . . is marked with a big star at 68°, the safe temperature for most of your darkroom solutions. Price, 45 cents.

...and to get beginners off to a flying start,

KODAK ABC PHOTO-LAB OUTFIT . . . contains everything you need for easy developing and printing—metal printing box with 4 x 5½-inch negative area, darkroom lamp, trays, chemicals, stirring rod, graduate, darkroom thermometer, printing paper, film clips, and an illustrated book of complete instructions. Price, $6.50 plus tax.

EASTMAN KODAK CO.,
ROCHESTER 4, N. Y.

"Kodak" is a trade mark

Kodak

His hobby is gunsmithing. He uses Nicholson files.

YOU CAN TELL
A CRAFTSMAN
BY THE TOOLS HE USES

ONE thing you'll notice about a real craftsman is the kind of tools he uses. They don't need to be fancy or intricate, but you can be sure they're top quality—the very finest made.

Files, for example, are selected with special care. For filing is an art. And the right file in hands that know how to give it "just the right touch" is often the deciding factor between a masterpiece and a failure. This is why you'll find a wide assortment of Nicholson or Black Diamond brand files on the work-benches of most artisans. Their superior performance far outweighs their small extra cost.

Try a few and see if they don't do better work, cut faster, last longer, cost less in the long run. They're easy to get—good hardware stores carry a practical variety.

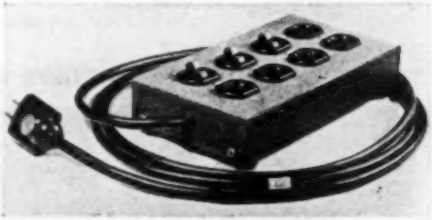
Write for free book, "File Filosophy." It tells how to choose, use and take care of files.

NICHOLSON U. S. A.
NICHOLSON FILE CO., 19 Acorn St.
Providence 1, R. I.
(In Canada, Port Hope, Ont.)

NICHOLSON FILES *FOR EVERY PURPOSE*

Driller Costs Little

THIS low-cost, easy-to-operate well driller, which requires attention only at intervals of several hours, works either outdoors or indoors. Operating at approximately 38 strokes a minute, the drill progresses downward while automatically feeding out 60 feet of cable. A product of Consolidated Industries, of Wallingford, Conn., it measures six feet square at the base, eight feet tall, and weighs 450 lb. Power may be supplied by a ½- or ¾-hp. electric motor, or a small gasoline engine.



One Plug—Five Outlets

JUST plug in this unit and you have several electrical connections from a single outlet. Heavy bus-bar wiring is used internally in the device, which has separate switches for three of the connections. Produced by Ewart, Healy and Koch, Inc., of Boston, Mass., it is 4½ by 8 by 1½ inches. Protection against shorts or overloads is afforded by a fused attachment plug containing two 15-amp. cartridge fuses.

Dependable

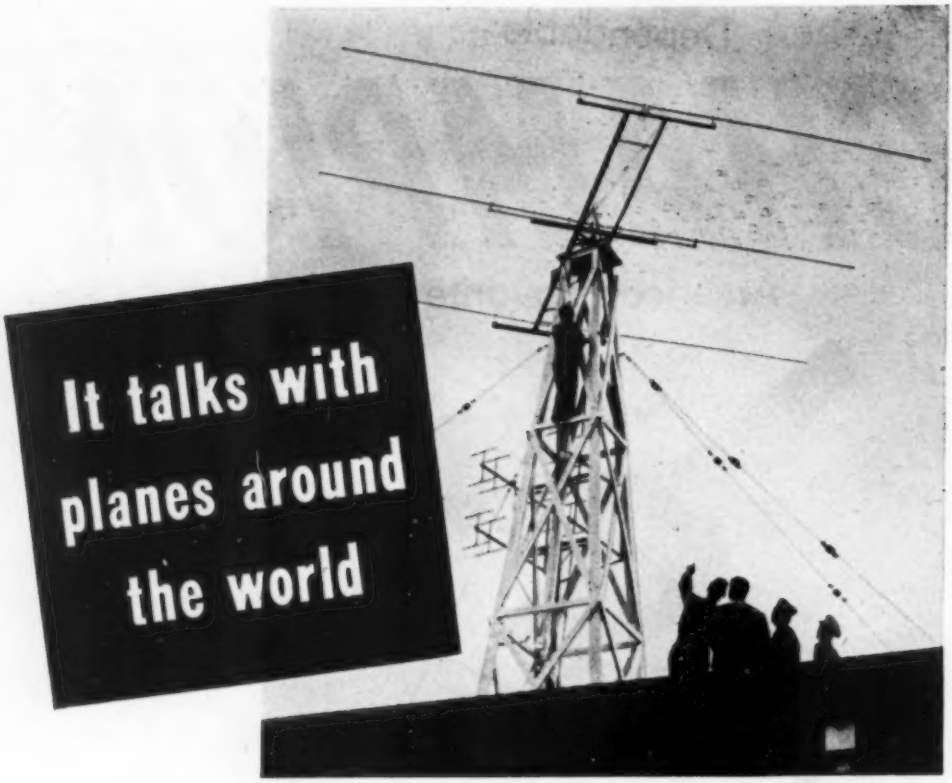
CHAMPION

America's Favorite Spark Plug

Your choice of Champion Spark Plugs for your car is made easy and sure by the fact that Champion has consistently been America's favorite spark plug, and is backed by performance records unequalled by any other. Champion Spark Plug Company, Toledo 1, Ohio.

FOLLOW THE EXPERTS—**DEMAND NEW DEPENDABLE CHAMPIONS FOR YOUR CAR**

Listen to the CHAMPION ROLL CALL . . . Harry Wismer's fast sportscast every Friday night, over the ABC network



You're looking at a "rotary beam parasitic array antenna." What it does is big as its name. By high-frequency continuous-wave transmission, the Air Force can talk to planes anywhere on earth.

Here's an instance. Recently, 8 Superforts departed Tokyo on a non-stop flight to the nation's capital. Air Force—in Washington—made contact a few minutes after their departure, stayed in communication with its winged offspring right to their destination.

This wizard antenna and its witch-wife—a supersensitive receiving antenna—are a joint accomplishment of Signal Corps and Air Force. It is typical of technical advances that are the daily business of our Armed Services.

And YOU might have played a part in that development!

Our peacetime Army and Air Force offer unlimited adventure on the frontiers of science.

YOUR ARMY AND AIR FORCE SERVE THE NATION AND MANKIND IN WAR AND PEACE

They want men like you—**men with** natural technical ability, men with **a burning** desire to get ahead. If you are 17 to **34 and a high** school graduate, for example, you may **choose the** technical training you want **before** enlisting.

Add other advantages of an Army or Air Force career: highest pay in history . . . free board and shelter and medical care . . . broad educational opportunity . . . travel . . . retirement income for life. Get all the facts now from your nearest U. S. Army and U. S. Air Force Recruiting Station.

U. S. Army and U. S. Air Force Recruiting Service

CAREERS WITH A FUTURE

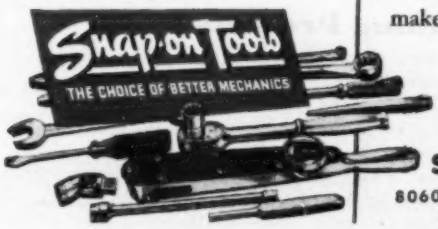
U. S. Army and U. S. Air Force

a new Ferret Set

by Snap-on

A new design... strong... adaptable... they squeeze into close places easily

(All units 3/8" Square Drive)
1/4" and 5/16" Single Broached Sockets
11 — Double Broached Sockets
from 3/8" to 7/8"
1—Speeder Wrench 1—8" Ratchet
1—Sliding Tee 1—Nut Spinner
1—Universal Joint
3", 6", and 12" Extensions
—Complete in a metal box,
19½" x 5¾" x 1⅜" — specially
designed for this set.
Rich red enamel finish.



Yes, a new Ferret Set . . . new in design . . . way over par in performance — and they're twice as strong as you would expect such slim, slender handles and thin-walled sockets to be.

They squeeze into tight places and get those hard-to-reach nuts and bolts that defy the ordinary type wrench. Newly designed by Snap-on engineers, they make quick easy work on many of the tough jobs on modern motors and engines.

Be sure to ask your "Snap-on" man to show this set the next time he calls.

SNAP-ON TOOLS CORPORATION
8060-C 28th Avenue • Kenosha, Wisconsin
INTERNATIONAL DIVISION: KENOSHA, WISCONSIN, U. S. A.

Yours for YEARS of Sweet Performance

When you look for quality features in an outboard motor, look for them in the line where they were originated, developed, and perfected.

These are JOHNSON Developments

- Perfected Alternate Firing
- Dual Carburetion
- Reverse
- Shock Absorber Drive
- Rotary Valve
- Ready-Pull Starter
- Die Cast Cylinder Block
- Anti-Cavitation Plate
- and many others

Also yours, in a *Johnson*, are Nation-Wide Service, High Trade-in Value, Long Life.

FREE Handy Chart

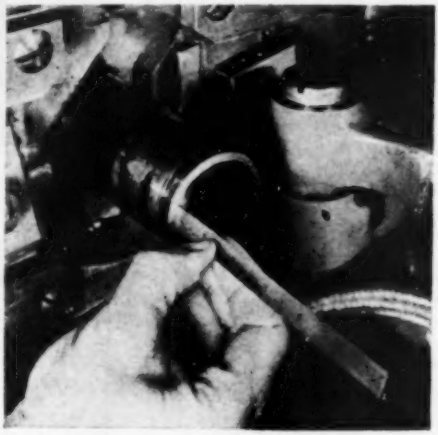
Write for the new 1948 Sea-Horse Handy Chart. Illustrates, charts the 5 great Johnsons for '48. See your Johnson Dealer about delivery. Look for his name under "Outboard Motors" in your classified phone book.

Johnson Motors, 500 Pershing Rd., Waukegan, Ill.
Johnson Motors of Canada, Peterboro, Canada

JOHNSON
SEA-HORSES
for DEPENDability

Battery Choice Offered

THIS small hearing aid contains its own tiny batteries, but for economy has a connection for plugging in the larger "A" battery shown at left above. The instrument, recently introduced by Sonotone, is made of plastic and finished in rhodium. It measures 4½ by 2½ inches and weighs just over seven ounces, including batteries.



Lining Protects Pipe

PIPE shown above is lined with a plastic material—Saran—that makes it resistant to chemicals, oils, and solvents. Designed to carry corrosive liquids, especially acids, the new pipe and fittings were developed by the Dow Chemical Company. Workman in photo above is measuring projection of Saran lining to insure proper sealing at a joint.

NEW NEW NEW

AUTO-LITE *Resistor* SPARK PLUG

Here's what it is

The many benefits which can be obtained through a wider than standard spark gap setting are well known to the automotive industry. Up to this time the rate of spark gap increase due to electrode erosion has been such that the desired wide setting has not been generally used. Auto-Lite, working with leading car and truck manufacturers, has Ignition Engineered a built-in 10,000 Ohm Resistor which reduces electrode erosion so that Auto-Lite Spark Plugs can now be given this wider gap setting desirable for improved operation and economy.

Here's what it does

PROMOTES SMOOTHER IDLING, because the wider spark gaps help eliminate occasional missing.

REDUCES MISFIRING due to lean spots in carburetion.

ASSISTS IN BURNING OF LEANER MIXTURES for improved engine economy at idle and throughout the speed range.

REDUCES RING AND CYLINDER WEAR when lubrication is washed away by gasoline not burned as a result of occasional misses.

INCREASES ELECTRODE LIFE up to 200% and more.

SUPPRESSES SPARK PLUG INTERFERENCE with radio, radio-telephone, radar and television reception.*

Advantages So Significant They Are Expected To Affect The Entire Industry

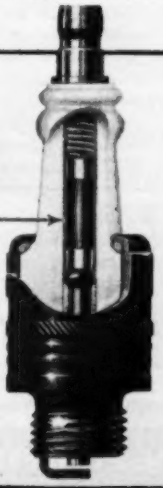
A complete line of Auto-Lite Resistor Spark Plugs with the built-in Resistor will soon be available for original equipment and replacement on popular makes of cars, trucks and tractors. The regular line of ignition engineered Auto-Lite Spark Plugs, which has won such an enviable reputation for dependability of performance, will continue to be manufactured. Ask your favorite dealer.

THE ELECTRIC AUTO-LITE COMPANY

Toronto 1, Ontario — Toledo 1, Ohio

NEW

BUILT-IN RESISTOR



Auto-Lite Ignition Engineers, working with leading automotive manufacturers, have developed the new Auto-Lite Resistor Spark Plug with this built-in resistor. As a result, improved operation and economy will be possible for the owners of cars, trucks and tractors everywhere.

TRY THIS AMAZING NEW

ANCO® CLEAR-FLEX

Trade Mark

WINDSHIELD WIPER BLADE

CAN'T FALL OFF—CAN'T BLOW OFF

FLEXES TO CLEAR THE LOW SPOTS

Know CLEAR-FLEX . . . the first Wiper Blade to conform fully to all windshield surface irregularities. Even wipes uniformly all types of curved windshields. Keeps clear those annoying hard-to-reach low spots common to all FLAT windshield glass. Clears quickly blinding road muck . . . slapped against your windshield from sloppy pavements . . . by passing cars. CLEAR-FLEX already has engineering approval for original equipment on coming models of high-grade cars.

THRILL WITH CLEAR-FLEX AS OUR "GUEST"

Deposit with your dealer only the regular retail price. Use CLEAR-FLEX through the next storm. Then IF you are willing, dealer is authorized to remove CLEAR-FLEX and refund all your money.

ANCO DEAD-LOCKER®

WIPER ARM

ANCO Arm fits quickly any wiper shaft. Suits any good wiper motor. Holds Blade true . . . at correct pressure. If not now on your car, ask serviceman to install a PAIR quickly for you. More than 250,000 good gas stations and service stores sell ANCO BETTER Blades and Arms.

Made by the makers of long-famous ANCO RAIN-MASTER® Blades and Arms . . . original equipment for years on DeLuxe models of high-grade cars. Your dealer knows ANCO.

Get yours next time you buy gas. May save you a costly smashup.

Quality Protected Under Fair Trade Laws
ANCO Patented Products—Patents Make Jobs

THE ANDERSON COMPANY
Established 1918
GARY, INDIANA

Proved by Big Truck Fleets—
Now Available to Motorists!

Scientific Discovery Ends Auto Radiator Rust-Ups!

Installed in radiator hose, Butler De-Scaler's galvanic cell action dissolves scale and rust throughout cooling system—keeps water crystal clear, mineral free.

At last—modern science ends your auto cooling system troubles caused by rust and scale! The amazing Butler De-Scaler, used in industrial boilers for over ten years and successfully proved in thousands of trucks and buses from coast to coast, is now available to car owners. De-Scaler's silver-plated cell and Butler-metal core, installed in radiator hose, produce a galvanic cell action that dissolves existing scale, prevents further formation—thereby prevents rust-ups, boiling over, pump and thermostat troubles due to scale. Guaranteed for 1 year or 25,000 miles. Does not interfere with anti-freeze or stop-leak. At service stations, garages and car dealers. $4.95 **Fair Trade List Price.** Butler Engineering Co., 2624 Rousseau Street, New Orleans 11, La.

BUTLER De-Scaler

Butler De-Scalers are available for use in home hot water systems, boilers, Diesel engines, etc.

GOOD WEAR FOR WORK GOOD LOOKS FOR PLAY

REEVES Army Twill is a double duty fabric that's right for work and play. It's highly resistant to wear and tear, and its wide variety of vat dyed colors are fast to sun, water and perspiration. Being Sanforized*, it can take repeated washings and still come up fresh and new. For better looks and longer wear—demand Reeves Army Twill.

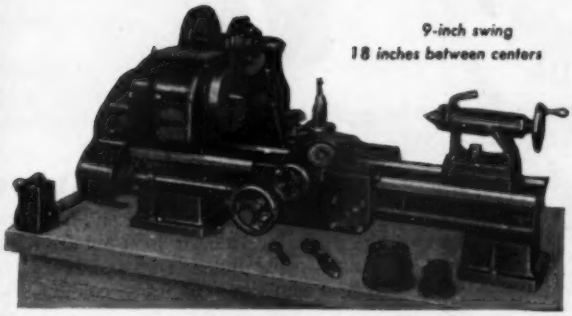
**Residual shrinkage less than 1%*

REEVES BROTHERS, INC.
54 Worth Street, New York 13, N. Y.

A NAME TO REMEMBER WHEN YOU THINK OF **BETTER** LATHES AND SHAPERS

Logan

SPEED, ACCURACY AND RUGGEDNESS



9-inch swing
18 inches between centers

Make This 9-Inch Logan Lathe a Stand-Out at $159.50

● Here in compact, 9-inch size are the speed, accuracy and precise, rugged construction that make the larger Logan Lathes outstanding industrial performers. High speed, ball bearing spindle stays accurate. Self lubricating bronze bearings protect vital points. Bed ways precision ground to within .0005" of parallelism. See it at your Logan Lathe dealer's, or write for information.

DISTRICT OFFICES

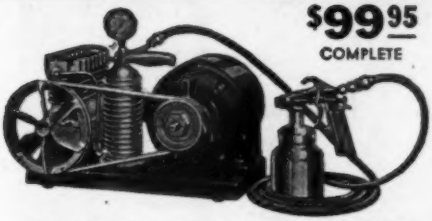
Woolworth Bldg., New York 7, N. Y. Cortland 7-9024
550 W. Washington Blvd. Chicago 6, Illinois Central 1246
1672 Mission Street San Francisco, Calif. Underhill 6682
700 Commerce St. Dallas 2, Texas Central 4075

LOGAN ENGINEERING CO.

PRESSURE QUEEN

FOUR CYLINDER
PORTABLE AIR COMPRESSOR
SPRAY PAINTING OUTFIT

$99.95
COMPLETE



COMPACT ● RUGGED ● POWERFUL

The ideal air supply for home and farm workshop, machine shop, garage, service station and contracting painter. Inflates tires; refinishes automobiles, trucks, implements and furniture. Paints buildings better, faster and at lower cost than brush work. Compressor has 4 cylinders, drop forged crankshaft, heat treated valves and pistons, bronze bearings, forced feed lubrication. 50-60 lbs. pressure without pulsation. Price includes compressor as shown, with air gauge, 15 ft. hose, spray gun and ⅓ h.p. motor; fully guaranteed. With ½ h.p. motor—$109.95.

IF YOUR DEALER DOES NOT SELL PRESSURE QUEEN WRITE DIRECT.

THE CAMPBELL-HAUSFELD CO.
151 RAILROAD AVE. HARRISON, OHIO

Shakespeare's
Resinated GLASS Fiber WONDEROD

The remarkable resiliency and strength of resinated glass fibers (250,000 lbs. per sq. in.) give WONDERODS amazing POWER and ACTION. Exclusive HOWALD Resinating Process is the secret. Never "gets tired"—keeps alive and lithe, packs a thrill with every cast, every strike! Bait and fly casting models. Buy at your sports store.
FREE TACKLE BOOK and Pocket Fishing Calendar. Reels, Rods, Lines, Accessories, Fishing tips. Send coupon.

Shakespeare Company
Dept. 93, Kalamazoo 2, Michigan
Send me your FREE TACKLE BOOK and Pocket Fishing Calendar.
Name.....
(Please write address and zone No. below)

Shakespeare FINE TACKLE

Speed Sweep

THE BRUSH WITH THE STEEL BACK

MD

Sweeps cleaner, faster— Out lasts ordinary brushes 3 to 1!

Mail Coupon Today

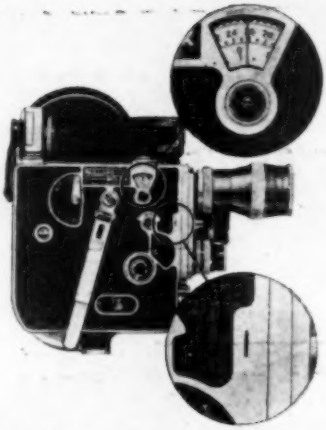
Milwaukee Dustless Brush Co.
530 N. 22nd St., Milwaukee 3, Wis.

Please send me complete information about Speed Sweep brushes.

Name _____

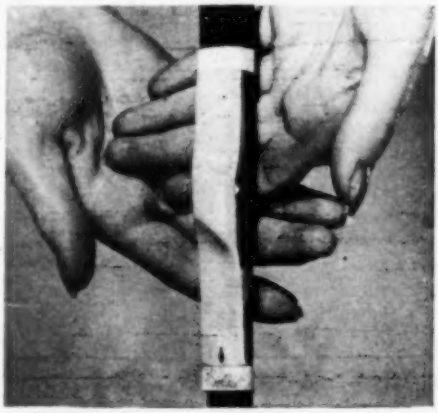
Street Address _____

City, State _____



Aids for Movie Makers

A BUILT-IN frame counter and a calibrated film plane for accurate focusing are features of new model Bolex H-16 and H-8 motion-picture cameras. The frame counter, shown above in top inset, has two dials, one registering each frame up to 50, the other keeping a cumulative count. This device is said to be particularly valuable for trick work. Inset below camera shows the film plane calibration mark that provides an accurate point from which the focusing measurements necessary for close-ups may be made.



For Better Putting

THE molded plastic golf-stick grip finder shown here lines up both thumbs and keeps hands together for a firmer grip. Made of Tenite by Sterling Injection Molding, Inc., of Buffalo, the device, unaffected by perspiration, is attached by adhesive tape.

8" MP QUALITY TABLE MODEL TILT-ARBOR SAWS

OIL IMPREGNATED BRONZE BEARINGS OR DOUBLE SHIELDED BALL BEARINGS, BOTH WITH THE PATENTED BALL BEARING TRANS-AXIAL MOTOR DRIVE

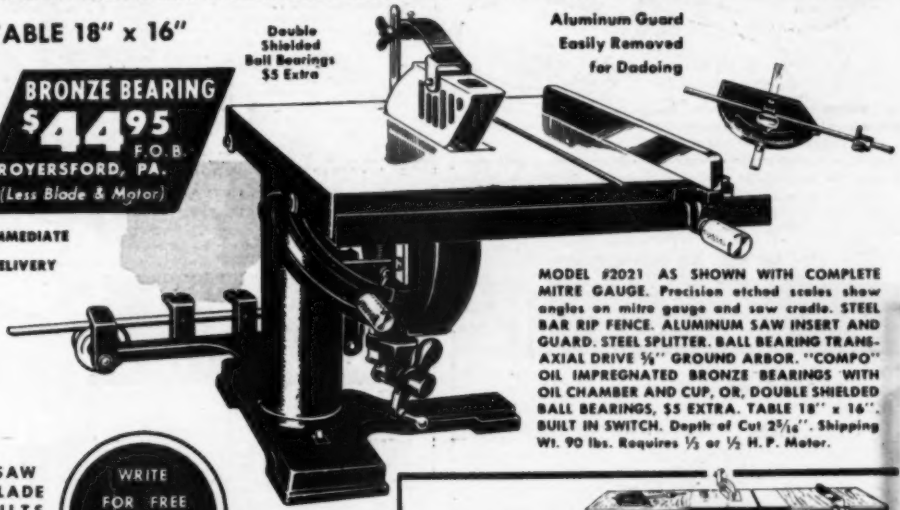
TABLE 18" x 16"

BRONZE BEARING
$44.95 F.O.B.
ROYERSFORD, PA.
(Less Blade & Motor)

IMMEDIATE DELIVERY

Double Shielded Ball Bearings $5 Extra

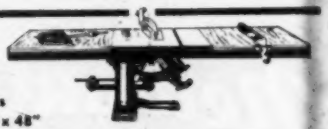
Aluminum Guard Easily Removed for Dadoing



MODEL #2021 AS SHOWN WITH COMPLETE MITRE GAUGE. Precision etched scales show angles on mitre gauge and saw cradle. STEEL BAR RIP FENCE. ALUMINUM SAW INSERT AND GUARD. STEEL SPLITTER. BALL BEARING TRANS-AXIAL DRIVE 5/8" GROUND ARBOR. "COMPO" OIL IMPREGNATED BRONZE BEARINGS WITH OIL CHAMBER AND CUP, OR, DOUBLE SHIELDED BALL BEARINGS, $5 EXTRA. TABLE 18" x 16". BUILT IN SWITCH. Depth of Cut 2 5/16". Shipping Wt. 90 lbs. Requires 1/3 or 1/2 H. P. Motor.

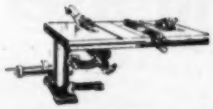
SAW BLADE TILTS • TABLE STAYS LEVEL

WRITE FOR FREE ILLUSTRATED FOLDER



Model #2021
With 2 Extensions
Makes Table 18" x 48"

TABLES PRE-DRILLED FOR EXTENSIONS



1 EXTENSION MAKES TABLE
18" x 32"

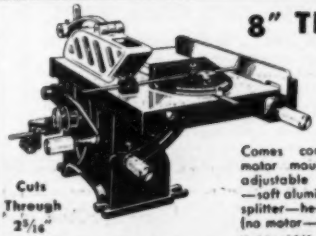
FLOOR MODEL

BALL BEARING
$79.50 F.O.B.
Royersford, Pa.
(Less Blade & Motor)

Table 18" x 32" including 18" x 16" extension. Additional extension available to increase table size to 18" x 48".

Complete as shown including Arbor with Double Shielded Ball Bearings and Trans-axial Ball Bearing Drive.

8" TILT TABLE BENCH SAW



Cuts Through 2 5/16"

Comes complete with Floating motor mount—mitre gauge with adjustable stop—aluminum guard—soft aluminum insert—spring steel splitter—heavy gray iron fence—(no motor—no blade).

Table 12" x 14" Tilts to 45°—Oilite bearings. Shipping Wt. 50 lbs.

$24.95 F.O.B. ROYERSFORD, PA.

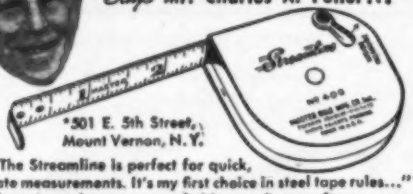
COMPLETE AS SHOWN

MARCUS • POLLAK **AMERICAN MACHINE & TOOL CO. INC.** —DEPT. 20— ROYERSFORD, PA.

MACHINE BUILDERS AND IRON FOUNDERS FOR OVER A QUARTER OF A CENTURY

"I always carry a MASTER Streamline"

Says Mr. Charles A. Fuller...*



*501 E. 5th Street, Mount Vernon, N. Y.

"The Streamline is perfect for quick, accurate measurements. It's my first choice in steel tape rules..."

If you're a home owner, hobby worker, craftsman, mechanic...or have occasion to use a handy measuring instrument, just try the beautifully designed, gleaming Master Streamline.

You, too, will find Streamline superior to any other steel tape rule in its class. Ask your hardware dealer about Master Streamline today, or use the coupon to order yours.

MASTER

REG. U.S. PAT. OFF.

WOOD AND STEEL TAPE RULES

Master Rule Mfg. Co., Inc. PS-3
201 Main Street, White Plains, N. Y.
Gentlemen:
I enclose $2.00. Please send my Streamline immediately.
Name.....
Address.....
City.....State.....

New BRUSH Electroplater

ESPECIALLY BUILT FOR MECHANICS, MODEL MAKERS HOME CRAFTSMEN

- MODEL MAKERS
- MAINTENANCE
- HOBBY SHOPS
- HOME SHOPS
- SALVAGE PARTS

Easy to Plate GOLD, SILVER, NICKEL, COPPER, etc....For Pleasure and Profit!

If you have a workshop—at home or in business—you need this new Warner Electroplater. At the stroke of an electrified brush, you can electroplate models and projects—you can replate worn articles, faucets, tools, fixtures, silverware, etc. with a durable, sparkling coat of metal...Gold, Silver, Nickel, Copper, Cadmium, *and after a bit of practice*, even Chromium! Everything furnished—equipment complete, ready for use. *By doing a bit of work for others, your machine can soon pay for itself.* So make your shop complete by getting a Warner Electroplater right away. Send today for FREE PLATING SAMPLE and illustrated literature. ACT AT ONCE.

WARNER ELECTRIC CO., Inc., Dept. R34
1512 Jarvis Ave., Chicago 26, Illinois

FREE Details & Sample!

WARNER ELECTRIC CO., Inc., 1512 Jarvis Ave., Chicago 26, Illinois, Dept. R34
Gentlemen: Send Free Sample and Details to:
*Name*_____
*Address*_____
*City*_____ *State*_____

PAINTERS' STRIPING TOOL

A TOOL... NOT A BRUSH

NEW, IMPROVED

Modern—streamlined—fits the hand like a fountain pen! Easy to use as a pencil. Draws parallel lines—straight, curve or circular. Does expert job on autos, furniture, toys, bikes, model planes, signs, bulletins, linoleum. (Makes wall board look like tile.)

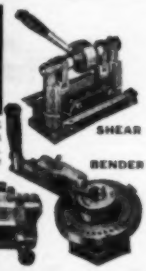
$1.00 POST PAID

Every painter and craftsman needs one! Type "M" MASTER Painters' Striping Tool complete with tip for 1/16" stripe, $1.00. Extra tips 1/64", 1/32", 3/64", 1/16", 5/64", 3/32", 1/8"—75c each. Tool with complete set of 7 tips $5.00. (C.O.D. orders 25c extra.) Paint dealers, write!

EASY AS USING A PENCIL!

WENDELL MFG. CO.
4234-A Lincoln Ave., Chicago 18, Illinois

DIE-LESS DUPLICATING



Many small parts can be formed without dies, to duplicated accuracy of .001" with DI-ACRO Precision Machines. — Benders, Brakes, Shears. Save die expense and time delay. Ideal for experimental and research work, making samples, models, etc. as well as regular production runs. Write for descriptive literature.

O'NEIL-IRWIN MFG. COMPANY
342 8th Ave., Lake City, Minn.

BOYS-IT'S FREE!

Exciting, new book tells about
"ATOMIC ENERGY"
and "THE WONDERS OF CHEMISTRY"

Also shows how to amaze friends with Chemcraft magic and do many exciting home experiments. Free. Send today!

THE PORTER CHEMICAL CO. 15 Prospect Ave., Hagerstown, Md.

"EVEREADY" Flashlight Batteries Outlast All Other Brands!*

**According to the "General-Purpose 4-Ohm Intermittent Test" of the American Standards Association.*

CARBIDE SCRIBER

LKM

NON-MAGNETIC

FOR HARDEST STEEL, GLASS, ETC.

Tungsten Carbide—the hardest metal made by man—carefully ground on diamond laps, brazed into stainless steel 6" handle for marking steel and other metals—for etching, marking, cutting glass. Cuts all directions. Easy to follow any contour. In plastic case with pocket clip.

$2.00 PRICE POST PAID

Dealers, Distributors and Salesmen Wanted

LUCAS-MILHAUPT ENGINEERING CO.
5051 SOUTH LAKE DRIVE • CUDAHY, WISCONSIN

Own a HARLEY-DAVIDSON

Swing into the saddle of a Harley-Davidson and set out for fun land! Pick up a pal along the way, or join a jolly caravan of riders happiness bound — to exciting race meets, hill-climbs, "gypsy tours", scenic wonderlands, faraway places. There's no sport like motorcycling — no fun like owning a Harley-Davidson. "Owning your own" is easier than you think. See your Harley-Davidson dealer today. Fill out and mail coupon now.

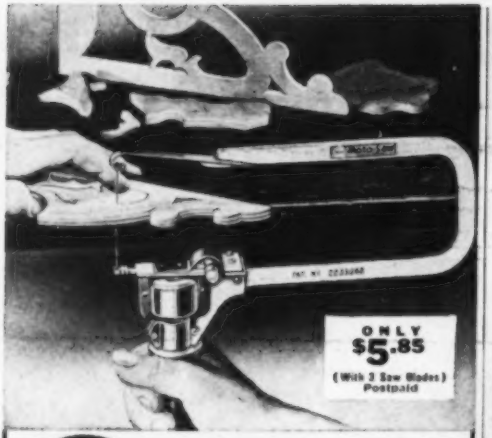
HARLEY-DAVIDSON
Motorcycles

HARLEY-DAVIDSON MOTOR CO., DEPT. PS, MILWAUKEE 1, WISCONSIN

Send FREE copy "ENTHUSIAST" Magazine filled with thrilling motorcycle action pictures and stories; also literature on your 1948 models.

Name.....

Address..... City..... State.....



ELECTRIC DREMEL POWER TOOLS

MOTO-SAW

THE AMAZING ELECTRIC SCROLL SAW

Boys from 8 to 80 (and girls, too) have fun with a Moto-Saw . . . it works more like magic than any tool you ever saw! It takes no effort to run, no perceptible pressure to feed. Runs 7,200 strokes a minute . . . easily cuts intricate scroll designs in medium hard wood up to ¾" thick. Blade holder faces blade 4 ways . . . permits you to saw sideways as well as forward and backward. No limit to length of stock it will cut . . . saws to center of 19" widths. **Moto-Saw is as safe as a hand saw** . . . has only two moving parts . . . never needs oiling. Uses 110-120 V. 50 or 60 cycle A.C. (only). Thousands of satisfied users.

MONEY-BACK GUARANTEE: If your dealer does not yet have Moto-Saw, send only **$5.85** . . . we'll pay postage. Or send $1, and pay postman balance plus postage. Money back if not delighted after 5 days' trial.

DREMEL MFG. CO., DEPT. S128-C, RACINE, WIS.

IF YOU WANT A

Beautiful Lawn

READ "LAWN CARE"

This FREE bulletin service will provide the know-how to improve your lawn—make it thick and weed-free. It's a Scott publication, and its readers (now near a million) have prize winning lawns from Maine to California. Simply write your name on a post card saying LAWN CARE, please", and the bulletins will come to your home regularly.

O M Scott & SONS CO

90 Spring St., Marysville, Ohio
Also Maspeth, N. J. and Palo Alto, Calif.

USE Scotts LAWN CARE PRODUCTS

SOUTH BEND

NEW BALL BEARING LIVE CENTER

Designed for maximum strength and rigidity, the Ball Bearing Live Center is recommended for high speeds, heavy roughing cuts, etc. 60 degree point runs in substantial precision ball bearing which is easily replaceable.

Center with No. 2 taper shank **$11.50**
With No. 3 shank . **13.50**

SOUTH BEND LATHE WORKS 456A E. Madison St. South Bend 22, Ind.

MAKE JEWELRY AND NOVELTIES AT HOME!

Work right on your kitchen table! No tools or experience necessary. Learn—earn within a week. Complete home instruction course, beautifully photographed, shows how to make 115 different designs of earrings, pins, sprays, brooches, hair ornaments, bracelets, candy dishes, ash trays, wall plaques, etc. Illustrates also 55 kinds of Sea Shells and Fish Scales often used. Explains fully home methods of dyeing, pearlizing, golding and glow-in-the-dark processes. Lists hundreds of raw materials with wholesale prices. Complete course only $1. Beginner's Kit, $3 ($3.50 in Canada), postpaid.

HOUSE of GIFTS, Box 4550-SP1, Coral Gables, Fla.

CASTING is Profitable

You can easily make **EXTRA MONEY** casting Bookends, Statues, etc. Complete "Cast-Kit" contains everything needed: 1 qt best Latex; 5 lbs Marblite Casting Clay; 3 Modelers; Scraping Knife, & Full instructions. Only $4.50 postpaid (or COD plus fee). Valuable 40-page Craft Catalog FREE. (WVa Orders add 9c Sales Tax.)

DWINNELL CRAFT SHOP • Dept. PS-83, Elm Grove, Wheeling, W. Va.

Everything in Radio!

Make **Radolek** your buying headquarters for Radio-Electronic repair and replacement needs. Large stocks assure finest, most complete selections of all available items at lowest prices. Your orders receive special attention for fastest delivery. Send today for FREE **Radolek Buying Guide.**

RADOLEK CO., Dept. A-838, 601 W. Randolph St., Chicago 6, Ill.

FREE RADIO BUYING GUIDE

A 10-Ton Press at Low Cost

Pressing, separating, bending, and straightening jobs in your shop are easy with this press. Ten-ton capacity provides ample pressure. Adjustable table takes work up to 18 inches wide and 11½ inches high. Send for free bulletin showing press and wide variety of accessories.

UT-10A Press f.o.b. factory $31.00

DAKE ENGINE COMPANY
622 Seventh Street, Grand Haven, Michigan

LABORATORY MICROSCOPE
600 POWER $22.50

3 Objectives—75X, 300X, 600X
A professional type microscope priced within the reach of the amateur. For school, laboratory, physician, and student. Color corrected achromatic lenses. Professional size eyepiece and objective interchangeable with all standard professional makes. Height 14 inches. Weight 5¼ lbs. Stage 4"x4". 2 wheel focusing. Body tilts any angle. Microscope complete with 3 objectives, prepared specimen slide, and 96 page book on microscopy, only $22.50.

We pay the postage. Immediate delivery. Money back guarantee.

BROWNSCOPE CO.
Dept. 3P, 24 West 45th St., New York 19, N.Y.

WOODWORKERS . . . Get this
CONSTANTINE MASTER MANUAL

Get the Most Fun From Your Hobby
Indispensable to woodworkers. Newest, biggest edition, more pages, more color, helpful how-to-do-it articles, pre-war and new items, more bargains. Send 25c today and we will include
FREE! FULL YRS. SUBSCRIPTION
to Chips and Chats, published bi-monthly. Keeps you up-to-date on everything in woodworking, offers big money-saving bargains. Send now.

ALBERT CONSTANTINE & SON, Inc.
793-R 135th Street, New York 54, N. Y.

make your own Gems
29.50 F.O.B.

All necessary lapidary equipment is furnished, including a super-charged diamond blade for sawing, and all wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt, for only $29.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

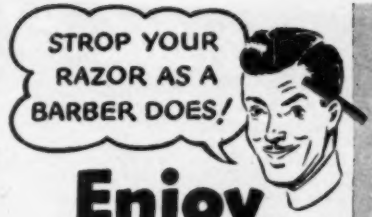
B&I MANUFACTURING CO.
Dept. M — Burlington, Wis.

FREE! FAMOUS BLUE BOOK CATALOG

GAME SUPPLIES
Club Furniture - Counter Games - Punchboards - Magic Cards Readers, Read the backs - Inks - Daubs - Poker Chips - Tops Flats - Layouts - Game Boxes.

K.C. CARD CO., 838 South Wabash Ave., Chicago 5, Ill.

"Paint-it-Yourself" with **NU-ENAMEL**
ONE COAT COVERS — NO BRUSH MARKS
NU-ENAMEL DEALERS EVERYWHERE



Enjoy new blade comfort every day

STROPS—CLEANS WITHOUT REMOVING BLADE

RAZOR, STROP AND 5 VALET BLADES $1.25

SELF-SHARPENING . . . ONE PIECE

WITH MOLLY YOU CAN FASTEN ANYTHING and do it quickly, neatly and safely. MOLLY will hold fixtures securely to floors, ceilings or any hollow wall construction . . . Simple to install, all you need is a screw driver. Sold by leading hardware stores everywhere.

Write for Free Descriptive Folder

MOLLY SCREW ANCHORS

MOLLY CORP.
522 COURT STREET
READING, PA.

No other tool like it!

BURGESS vibra-tool

Writes on . . .
Watches
Glassware
Tools
Leather
Plastics
Costume Jewelry
Pots and Pans
Sporting Equipment

$7.50

Engrave your name . . . etch letters or designs . . . place permanent identification marks on anything with this unique hand tool. Carves wood and linoleum, cuts cardboard and balsa, tools leather. Just plug in on any 110 volt AC line. No home shop is complete without a Burgess Vibra-Tool. See your dealer or write for information.

DELUXE KIT
Vibra-Tool complete with 22 attachments in handsome, polished wood chest.....$16.50

BURGESS Vibro-Tool Division
LAKE ZURICH, ILLINOIS

MAKE MONEY Sharpening LAWN MOWERS

Every lawn mower needs sharpening every season. Cash in on this big demand with the Foley Lawn Mower Sharpener. J. L. V. made as much as $100 a week. W. A. T. made over $1000 in 9 months.

WORK AT HOME—part or full time. It's a repeat business because customers come back time after time to get their mowers Foley sharpened. The Foley Electrakeen System is used and endorsed by lawn mower factories—mowers cut better and stay sharp longer.

COMPLETE AUTOMATIC—you simply put the lawn mower in the machine—without removing handle—and turn on the power. The Foley (on the market since 1929) automatically sharpens all blades *at once*. You can get *immediate delivery*.

SEND FOR FREE PLAN—tells how to start—no canvassing—99c out of every dollar you take in is clear profit for you! Mail coupon now.

FOLEY LAWN MOWER SHARPENER

FOLEY MFG. CO., 208-8 Foley Bldg., Minneapolis 18, Minn.
Send **FREE PLAN** on Foley Lawn Mower Sharpening business.

Name.....

Address.....

YOU CAN SELL

READ WHAT JOHN LEHMAN SAYS ABOUT FYR-FYTER'S
BIG MONEY OPPORTUNITY FOR SALESMEN

"Fyr-Fyter extinguishers have given me a steady, permanent income for 17 years. The market for fire protection is enormous, the line is the finest and most complete made. If you can sell, here's an opportunity that has everything."

Build a Business at Home

No overnight traveling . . . no investment . . . no billing, collecting, or delivering. Non-seasonal and no *top limit in earnings*. Call on the best type prospects—stores, hotels, homes, farms, theaters, factories, etc. Sell direct from the factory. Write letter including age, experience, health, etc.

Fyr-Fyter, Dept. 92-39, Dayton 1, Ohio

REAL GAS ENGINE $6.95

The new THOR "B"—Sensational miniature gasoline engine that **really** works. Super-power performance. Smooth, velveted power that roars into action with a "twist of the wrist." Over 25,000 already sold. 1/6 H.P. Complete with coil and condenser. Ready to run, only $9.95. In KIT form, fully machined, 5 minutes to assemble, $6.95, without coil and condenser. Powers all models. Fully illustrated instructions. Send $1.00—shipped collect same day C.O.D. **FREE.** Send for 24-page Illustrated Hobby Catalog.

AMERICA'S HOBBY CENTER
Dept. S-38, 156 W. 22nd St., N. Y. 11

Ottawa Self-Propelled Buzz Master

CLEARS LAND FAST! Powerful 7-HP motor with friction clutch for safe operation. Cuts down timber, brush and hedge; turn blade vertically and saw logs to length. Also furnished with post hole diggers. Has clutch pulley for belt work.

No Other Like It!

OTTAWA MFG. CO., 1-801 Brush Ave., Ottawa, Kansas

OWN A Printing Business

Cards, Tickets, Stationery, etc. Good profit in spare time. **PRINT YOUR OWN** greeting cards, movie titles, church work, etc. Save money. Easy rules supplied. Raised printing like engraving too. Have home shop. Sold direct from factory only. Send diagram for supply book, suggested outfits, all details and advice on your needs. No obligation. **KELSEY, INC. C-33, MERIDEN, CONN.**

$2.95

TORNADO GAS TORCH

The Modern Way of Soldering

Ideal for hard and soft soldering. Will heat quickly; solder will flow freely and smoothly. No compressed air required. Self-adjusting. Safe. Economical. Can be used for annealing small parts and bending metal parts. Generates a heat of 1700° F. Simply connect to any illuminating gas jet with a rubber hose and operate. Tornado Torch No. 119 comes with three tips, (1/8", 1/4", 3/8" blast).

Tornado Gas Torch No. 119—Complete with 2 tips, for Natural Gas or Bottled Gas; with 3 tips for Manufactured Gas. $2.95 per set. See your dealer or order direct. Send check or money order—post paid.

Robco Corporation, 204 F. 44th Street, New York 17, N. Y.

FASTEST PLANER in the WORLD at this Low Price... $195.00

Belsaw Multi-Duty Planer

Needed by every saw mill owner and woodworking shop to Speed Up Production—Increase Profits. Belsaw high speed thickness planer provides for single surfacing stock up to 12" wide by 6" thick at the high speed rate of 24 lineal feet per minute for HIGH PRODUCTION. **Planes green or dry sawed lumber into higher priced, valuable smooth and worked forms.** Machine has welded all STEEL frame . . . nothing to break. Safety-type all Steel cutterhead runs in heavy duty ball bearings. Three HIGH SPEED Steel knives make 42 cuts per inch for smooth finish. Belsaw Multi-Duty Planer is REALLY ECONOMICAL . . . adequately powered by any motor developing 2 horsepower . REALLY PROFITABLE . . . lowest in investment and operating costs, and takes inexpensive attachments for all common planing mill operations: Jointing, Rabbeting, Grooving, Matching. Produces S4S Finish (surfaced four sides) without the great investment required for S4S Surfacers. **Simple accessories provide for SHARPENING and JOINTING its own knives.** You get BIG VALUE in Belsaw, and provide for your progressive growth. **Write for FREE specifications,** illustrations and low prices.

BELSAW MACHINERY CO. 1025 Field Building
315 Westport Rd., Kansas City 2, Mo.
World's largest manufacturers of light sawmill and woodworking equipment

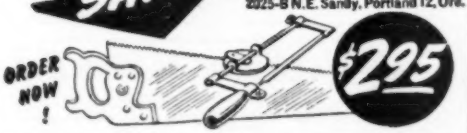
The SPEED SAW FILER

Saves You Time, Money

Now FILE Your Own SAWS

Now you can do expert saw filing at home. Lifetime tool makes precision filing easy for even the most inexperienced. Two simple adjustments make it fit any type hand saw. Keep your saws extra sharp and true-cutting with a Speed Saw Filer. Complete with file, ready to use. Money back guarantee. Cash with order, prepaid (C.O.D. postage extra.)

THE SPEED CORP.
2025-B N.E. Sandy, Portland 12, Ore.



ARRIVE on TIME, EVERY TIME with a

HULL AUTOMOBILE COMPASS

● Avoid confusion and delay of wrong-way travel. Drive by Hull. Be sure everywhere, night or day. **Beaconlite** illuminated, $5.95. **Streamline** standard, $3.95. At your dealer's. Write for circular.

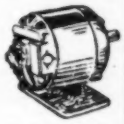
HULL MFG. CO., P. O. Box 246-E3, Warren, Ohio

NEW ELECTRIC MOTORS

Single Phase Jack & Heintz Motors

60 Cycles • 115 Volts • 1725 RPM

1/6 HP	$15.67
1/4 HP	17.76
1/3 HP	22.27
1/2 HP	40.37



We carry all sizes and makes in stock. Price catalogues on request. Quantity discounts available. No C.O.D.'s.

ALBIN MACHINE CO. INC.
750 6th Ave. N. Y. C. 10

STOP LEAKS

In Concrete, Brick or Stone WALLS and FLOORS

Apply Smooth-On No. 7 Iron Cement to cracks, holes, seams and porous spots, using a trowel or stiff brush. The surface to which you apply it may be either wet or dry. In about 24 hours the Smooth-On will have set hard, sealing the leaks. It will stay in place, because it expands slightly as it sets.

Use Smooth-On No. 7 also to line cisterns, swimming pools, troughs, fountains, septic tanks, etc. Use it to seal openings where piping passes through walls.

Buy Smooth-On No. 7 in 1-, 5-, 25-lb. or larger size at your hardware store; if they haven't it, write us.

FREE REPAIR HANDBOOK

40 pages. 170 illustrations. Clear, simple directions for stopping leaks, sealing cracks, tightening loose parts in household equipment and autos. Every home needs this useful repair guide. Just mail the coupon for YOUR free copy.

Sign and Send NOW

SMOOTH-ON MFG. CO., Dept. 58C,
570 Communipaw Ave., Jersey City 4, N. J.

Please send me a Smooth-On Handbook and No. 7 Folder

Name.....

Address.....

3-48.....

Do it with **SMOOTH-ON**
NO. 7 IRON CEMENT

MORE TIME for FUN—

Robert Page Lincoln (right) and Jim Owen at breakfast.

—When You COOK WITH A Coleman Folding CAMP STOVE

"It's the Best of All Outing Pals!" —says Robert Page Lincoln, famous outdoorsman, writer and authority on hunting and fishing.

"I was one of the first advocates of the use of the Coleman Stove and Lantern. The gleam of the Coleman Lantern in camp at night and bacon frying on a Coleman Stove are what I call 'tops'!"

COOK with GAS—Anywhere

The Coleman Camp Stove makes and burns its own gas from gasoline—cooks like city gas! Just set up—light up—and you're cooking. Two big windproof burners—easily removable tank. Ask your dealer for a demonstration!

FISH LATER—Have More Luck with a Coleman Floodlight LANTERN

You don't have to hurry back to camp at nightfall—the Coleman Floodlight Lantern—big, high candlepower light—will show the way. Safe, stormproof! See it at your dealer's.

Coleman STOVES LANTERNS

THE COLEMAN CO., Inc., Wichita 1, Kansas

FREE FOLDER!

THE COLEMAN CO., Inc.
Dept. 231-PS, Wichita 1, Kansas
Send me your folder on the Camp Stove and Lantern—no obligation.

NAME _____

ADDRESS _____

Help Prevent Forest Fires—COOK SAFELY

NOW—For the First Time a SCREW-STEM FILTER PIPE for $1

Never before a screwstem pipe with all these features: patented free-turning self-aligning *Ajustomatic* stem—an easy-to-replace Filter—choice of smart styles in fine imported briar—and a low, low price making it the best buy in pipe history! At Better Stores . . . .

$1

HENRY LEONARD & THOMAS, INC. OZONE PARK 17, N. Y.

CROSMAN *Silent* RIFLE

POWER without POWDER

You'll like a Crosman because there is no recoil to spoil your aim . . . no noise . . . no odor . . . no cleaning! Rifled barrel for greater accuracy . . . adjustable power, too, for short or long range shooting indoors or out. Available in .177 and .22 cal. models.

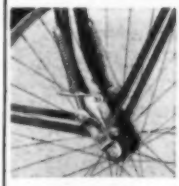
AT YOUR DEALER OR WRITE DIRECT

CROSMAN ARMS CO., INC.
9E HENRIETTA ST., ROCHESTER 7, N. Y.

Do You Ride a Bike? Here's the Real

SHOCKMASTER

for all Bicycles



- LEVELS ROUGH ROADS
- PREVENTS BROKEN SPOKES, WHEELS, FORKS
- MAKES RIDING SMOOTHER, SAFER
- EASY TO INSTALL

A Shockmaster and front wheel shock absorber ruggedly constructed of nickel plated steel and engineered for years of real service. It'll pay for itself in added pleasure, saves tires and eliminates many costly repair bills. 20,000 satisfied users. Order yours today. Only $3.69 postpaid. No C.O.D.'s. Complete satisfaction or money back. Dealers Wanted.

H. M. GIBB and COMPANY
1304 PENOBSCOT BLDG. DEPT. B DETROIT 26, MICH.

IT STAYS STUCK!

WITH...

MULTI-PURPOSE AMBROID

If you want *permanent results* from an adhesive, you can't equal multi-purpose Ambroid liquid cement — for home workshop, household or factory. A quality leader for 37 years, ready-to-use Ambroid is waterproof, transparent, quick-drying, extra strong. Flexible, heat-and corrosion-resistant. For assembling, repairing or mending jobs, keep Ambroid handy. At your dealer's, or send 25¢ for big 2-oz. tube post-paid. Money back guarantee.

Also 50¢ 4-oz. tube. Pts., qts., gals., for industrial use.

AMBROID

306 Franklin St., Boston 10, Mass.

SEE THIS "Authenticast" SHIPS VALUED AS HIGH AS $150 WHEN BUILT. Priced from $6 to $12.95. Each Kit Complete. Many Model Builders are selling the Models they Build. SEND 35c for 32pp. colorful catalog.

COMET METAL PROD. CO., INC., Richmond Hill 18, L. I., N. Y.

101 Money-Making Ideas in New Larson Catalog.

EVERYTHING In LEATHER

with **LARSON Leathercraft**

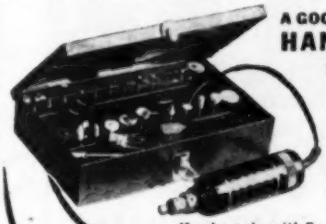
Make Money

On easy-to-assemble belts, gloves, purses, wool-skin toys and mittens, many other useful items. Wide line to choose from. Moderate priced tooling leathers as well as top quality calfskins. All tools and accessories. No experience necessary; instructions come with materials.

Send ten cents at once for catalog.

J. C. LARSON COMPANY
4234 ARTHINGTON ST., CHICAGO 24, ILLINOIS

THE FIRST TOOL OF THIS KIND—TODAY'S FINEST! Smooth, steady power at your fingertips! Perform precision operations not possible with any other portable tool! With a Handee you can turn out professional looking projects for pleasure or profit—ship, plane and train models, delicate, internally carved costume jewelry, wood carvings, puppets, initialed tumblers, etc. AC or DC. 25,000 r.p.m. Wt. 12 oz. Over 500 accessories made especially for the Handee!



A GOOD START—THE HANDEE KIT

HANDEE Tool and 40 most popular accessories packed in compact steel carrying case. You'll be amazed at what you can accomplish! At stores or postpaid **$27.50**

Handee only, with 7 accessories, $20.50

FOR YOURSELF OR A FRIEND... THE GIFT OF A LIFETIME!

NEW PLASTIC-CRAFT KIT

For internal carving. Contains special plastic cutters, buffers, sanding discs, buffing compounds, a liberal supply of clear plastic, dyes, cement and instructions. At stores or postpaid **$6.95**

GET A HANDEE at stores everywhere. If they can't supply you we'll send it postpaid. Satisfaction guaranteed. Free 52-page Manual on request.

CHICAGO WHEEL & MFG. CO.
1101 W. Monroe St. Dept. PO, Chicago 7, Ill.

Send ☐ Handee Kit ☐ Handee Tool ☐ Plastic-Craft Kit
☐ C.O.D. ☐ Remittance enclosed ☐ Send Manual

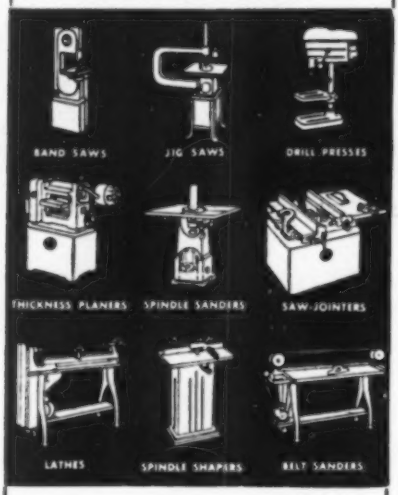
Name .....

Address .....

.....

BOICE-CRANE POWER TOOLS

for shop men and homecraftsmen.



Write for literature on this versatile, low-cost, sturdy line.

BOICE-CRANE COMPANY
944 Central Ave., Toledo 6, Ohio

READY CUT HOMES

Order Now

Homes $1655.00 and up, freight paid. Orders filled in order received. Save $500 at least on modern production method homes. Much more compared with builders' prices. Anyone can assemble with simple plans furnished. Complete, including paint, hardware, roofing, glass, nails, etc.

Send 35c in coin for full color catalogue showing 37 modern low-priced homes and floor plans. Complete building plans ready for filing at low cost. Sold separately if desired.

Dept. PS-38
INTERNATIONAL MILL & TIMBER CO.
Bay City, Mich.

NONE BETTER!

SUPER DRILL GRINDER

Sharpens round shank drills from 3/32" to 1 1/16" in diameter, up to 11" long. Grinds old drills like new in 4 different point angles, using hand or power grinding wheels. Money-back guarantee.

Price only $2.95
At Dealers or Postpaid

Crandall Mfg. Co. 1512 W. Slauson, Dept. PS-27 Los Angeles 44, Calif.

NEWEST OTTAWA LOG SAW

SELF-PROPELLED — MOVES ANYWHERE on OWN POWER

World's fastest Log Saw. Powerful 6 H-P air-cooled motor. Attachments for sawing down trees, buzzing limbs, post hole digging and pulley for belt jobs. Big demand for wood, pulp, posts. Make big money sawing wood this easy way. Low factory-to-user prices. Nothing like it. FREE details.

OTTAWA MFG. CO., 7-B01 Pine St., Ottawa, Kansas

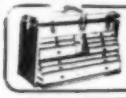
Burn-Rite Wood Burning Detachable Pen

Approved by Underwriters

Only one of its kind. Write for complete list of casting and wood burning sets.

$1.50 EACH POST PAID

RAPAPORT BROS. INC.
Dept. PS-3, 1830 S. Washtenaw Avenue Chicago, Illinois



GERSTNER Tool Chests

More years of satisfactory service built into Gerstner Chests for Machinists and Toolmakers. Free catalog.

GERSTNER TOOL CHESTS
548 Columbia St. Dayton 7, Ohio

NEW 1948

Plastics Supplies Catalog

Just off press. Full details on Plexiglas, Lucite, rods, sheets, tubes, Acetates, cements, dyes, buffs, molding sets, tools, carving kits, accessories. Everything in plastics. Gives prices, sizes, colors, etc. Send 10c, stamps or coin, with ad for catalog.

PLASTICS MFG. & SUPPLY CORP.
Dept. S-3. 4707 Euclid Ave., Cleveland 3, Ohio

KAYAKS

AQUA VIR

Easy to Build

OUTBOARDS ROWBOATS

25¢ COIN FOR ALL THREE

BOATS for Home Assembly

KAYAKS, ROWBOATS, DINGHIES, INBOARDS, OUTBOARDS, RUNABOUTS

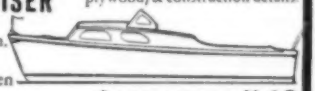
Cut-To-Fit for Quick Assembly. Everything Complete plus Illustrated Instructions. No Experience Necessary. Simple as A. B. C.

SEND 25¢ POSTAGE (COIN) TODAY FOR 3 MONEY SAVING ILLUS. CATALOGS

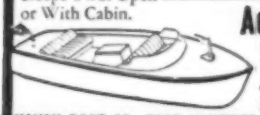
Showing all '48 Models (marine plywood) & construction details.

V-23 CRUISER

Length 23 Ft.
Beam 7 Ft., 10 In.
Draft 14½ In.
Sleeps Two. Open or With Cabin.



AQUAMOBILE V-18



Designed for Auto Engines. Open or with cab. Length 18 ft. Fast VEE Bottom Hull.

KAYAK BOAT CO., 703R-WHITTIER ST., NEW YORK 59, N. Y.

NEW STOP LIGHT Auto FLASHER

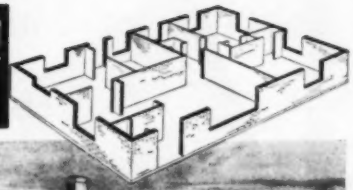
For Fast, Snappy Drivers

Makes your Stop Light Shout. Flashes 113 times a minute. Fully automatic when brake is applied. Approved by leading Safety Engineers. INSTANT ACTING. If your dealer can't supply you, send check or M.O. for $3.00. We pay postage. Dealers and Agents desired.

Patented.
Simple to install.

MACCHI and COMPANY
927 Larkin Street • San Francisco 9, California

All the BRIKCRETE for the Exterior Walls of this 37'x24' Home.. $268.79*



**Based on national average price. May vary slightly according to locality.*

Brikcrete is the dramatic answer to the nation's urgent demand for small homes with price appeal, eye-appeal and pride-appeal. For Brikcrete is cost-competition for lumber. It has the beauty of color and symmetry. And all the prideful qualities of the best masonry ever offered.

Brikcrete—and Brikcrete ALONE—combines the five considerations which influence the selection of a residence wall: beauty, permanence, low price, safety and comfort. With the added advantage of permanently low upkeep and depreciation costs.

Brikcrete is locally manufactured in a chain of plants throughout the country. Write us for free copy of descriptive brochure and name of plant nearest you.

World's Most Modern Masonry

Two sizes: 8x12x3⅓; 4x12x3⅓ (laid-up). Half and corner units for each size.

Self-contained insulation values because of a 43% void.

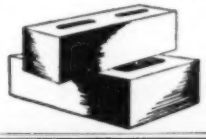
Meets all required compressive strength and absorption tests.

The 4-inch units make excellent partition walls for basementless homes. Can be plastered direct.

Standard colors include reds, buffs, browns, tan. Dozens of different color effects.

Approximately half the net weight of regular brick. Less burden on footings and foundations.

Twice the face size of regular brick. Half as many mortar joints.



BRIKCRETE ASSOCIATES, INC., 4677 S. Division, Grand Rapids 8, Mich.

If interested in establishing local plant write for copy of Brikcrete Book No. 2

BRIKCRETE

MUFFLERS STEELS and ALUMINUMS with a motorboat tone

SINGLES, Chev., V-8, Plymouth, Steels $5.50, Aluminum $7.00. Chry., Olds., Buicks, etc., Steels $7.50, Aluminum $9.00. V-8 and MERCURY DUALS, Steel $17.50, Aluminum $21.00. Split Manifold Sets, Steels $35.00, Aluminum $45.00. Aluminums are guaranteed for life of your car.

SANDEE MUFFLER CO.
BOX 296 LA TIJ. LOS ANGELES 43 CALIF.
2624 W SLAUSON AVE. LOS ANGELES CALIF.

FOR CRAFTSMAN, CARVER, SCULPTOR

Sculpstone

With the beauty of jade and workability of wood, Sculpstone appeals to hobbyist and artist alike.

No special tools are required. Sculpstone can be cut with a knife, filed, drilled, sandpapered, or turned on a lathe.

Sculpstone is mined in Egypt and the Far East and closely resembles jade. Its color ranges from white to black, blue to green, and pink to red. Send $1.00 for Introductory Kit and price list. Special Xmas Hobby Kit sent for $5.00. Large sizes and crude stone available. Postpaid: No C.O.D.

SCULPSTONE INC. 178 Suffolk St. New York 2, N. Y.

AMERICA'S FINEST BUMPER JACK

Here's an *all-around* hydraulic utility jack with hundreds of uses where easy lifting or pulling is required. Safest, quickest, easiest to use on any car built. Result of 15 years of advanced precision engineering. Extra long, heavy duty steel chain with forged steel grab hook picks up loads from 4" BELOW bottom of jack to 22" ABOVE. Base, handle socket, head and chain plate are all tough malleable iron castings. 17" hydraulic lift, 3000 lb. capacity. Order now at your dealer or send money order or check to

© 1948 American Hydraulics, Inc.

American Hydraulics, Inc.
SHEBOYGAN, WISCONSIN

American Hydraulics, Inc.
Sheboygan, Wisconsin
Enclosed find check or money order.
Please send.....American Bumper Jacks.
Name.....
Address.....

In every test SKAN has proved its excellence in competition with the highest-priced exposure meters in the field.

G-M LABORATORIES INC., CHICAGO 41

SKAN PHOTOELECTRIC EXPOSURE METER

GO FOR THE BIG ONES THE INDIAN WAY

PADDLE in waters where big fish feed. Be quiet. Be stealthy. Be fast. Bear down on the blade in an Indian craft. Streak to the spot where they're rising. An Old Town is light and responds like a birch-bark. It's sturdy and strong for hard use. It's easy to own, inexpensive to keep. Write today.

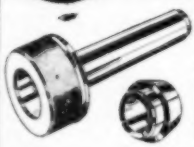
FREE CATALOG shows all kinds of canoes for paddling, sailing or outboards. Also outboard boats, big all wood family boats. Sailboats. Rowboats. Dinghies. Address Old Town Canoe Company, 443 Wood Street, Old Town, Maine.

"Old Town Canoes"

SOUTH BEND

NEW ADJUSTABLE COLLET BUSHING CHUCK—

provides an accurate method for mounting centerless armature shafts and similar parts in a lathe. Use in either head or tail spindle. The brass collets are adjustable for running or driving fits. Chucks supplied with 3 collets; 9/16", 5/8", and .637" capacity. Extra round collets, 1/4" to 1" by 16ths, $1.00 each.



Chuck with No. 2 shank **$8.95**
Chuck with No. 3 shank **$9.45**

SOUTH BEND LATHE WORKS 456A E. Madison St. South Bend 22, Ind.

for AMAZING acceleration

DIXIE-WESTERN

DUAL INTAKE MANIFOLDS for V-8 FORDS AND MERCURYS

$15.00 Gas Line and Throttle Kit $2.50 extra

Chrome Plated Velocity Stocks — $1.50 ea

By Test: Increased Acceleration by 26% Increased Power and Speed by 11%

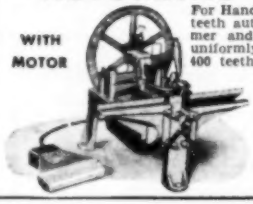
All DIXIE-WESTERN manifolds are brightly polished cast aluminum.

Dealers Wanted

DIXIE-WESTERN MANIFOLD CO.
Box 364 • Los Angeles 43, California

AUTOMATIC SAW SET

WITH MOTOR



For Hand and Band Saws. Set saw teeth automatically. Perfect hammer and anvil action sets teeth uniformly. Easy to operate. Sets 400 teeth a minute.

Write today for details on
GREATER PROFITS FOR SAW SHOPS

BURR MFG. CO.
8943-P Venice Blvd.
Los Angeles 34, Calif.

CODE SPEED SHORT CUT Be an expert. Learn to be a Telegraph or Radio Operator. Thousands of men needed. Intensely interesting work—good pay. Learn at home or wherever you are, quickly, easily with the famous Candler Speed System. Book of particulars Free. CANDLER SYSTEM CO., Dept. 6-C, Box 928, Denver 1, Colo. U. S. A.

TRAILER BUILDERS!

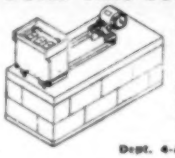
Insist on Safety-Engineered

- Bull Dog Hitches and Parking Jacks
- Torq-Less Axles

HAMMER BLOW TOOL COMPANY
D-22 Wausau, Wisconsin

Send for FREE Catalog

BUILD THIS CONCRETE BLOCK MACHINE



Sell blocks; or build your home, garage, barn, or filling station at 1/3 cost by making and laying your own blocks.

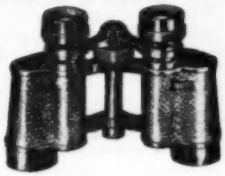
This simple machine which you can build yourself at a cost of $15 (excluding motor) will make a block in 30 seconds using only one form. Mass production can be achieved by a new simple method of removing blocks which allows two to four forms to one vibrator. Power driven concrete mixer plans also. Send dime for details and "How to Make and Lay Blocks" folder.

U-BUILD-IT SERVICE
Dept. 4-A, 206 West Wilder St., Tampa 3, Florida

ZEISS
PRISM BINOCULARS

BETTER THAN EVER

COATED OPTICS



FEATHER-WEIGHT 6x30, 8x30 AND 7x50 WITH CENTER FOCUSSING

The world's most famous glasses, with features unobtainable in any other make regardless of price, now cost LESS than other leading makes.

Send for descriptive literature

BROWNSCOPE CO.

Dept. 3P, 24 West 45th St. New York 19, N. Y.

WORLD'S FASTEST VISE

The new Heinrich "Grip-Master" is a SCREWLESS vise. Operates effortlessly . . . avoids tiresome winding . . . saves time. Movable jaw adjusted in a jiffy . . . locked securely by easy press on locking lever. Design permits drilling clear thru work. Jaws have built-in parallels . . . extra loading capacity. Bars and locking mechanism hardened and ground. The "Grip-Master" is the most revolutionary advancement in 100 years of vise manufacture.

MONEY BACK GUARANTEE

If your dealer does not have the "Grip-Master", we will ship express *prepaid* for cash with order. Model 3-SV (3" jaw), $16.50; 4-SV (4" jaw), $27.50. Larger sizes also available. Folder on request.

HEINRICH *Grip-Master* SCREWLESS VISE

NATIONAL MACHINE TOOL CO., DEPT. 228-C, RACINE, WIS.

BUILD YOUR POWER TOOLS

WITH OUR GUARANTEED INDUSTRIAL

POLY BALL BEARING **ARBORS**

(No extra charge for left hand threads) **ORDER NOW!**

C4-1/2x12 1/2 spindle, housing 2x8 $7.95 pp.
C5-5/8x12 1/2 spindle, housing 2x8 $8.25 pp.
C6-3/4x12 1/2 spindle, housing 2 1/4x8 $9.25 pp.
D8-1x17 1/2 spindle, housing 2 5/8x11 $17.00 pp.

New Departure Self Lubricating Bearings

POLY PRODUCTS, 2032-B E. Walnut, Pasadena 8, Calif.

For Outdoor Pleasure and Transportation

Ride a **Royal Enfield**

Famous English Lightweight Motorcycle...takes you anywhere

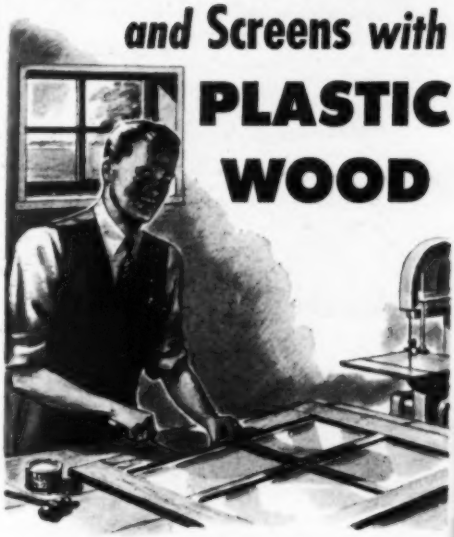
Royal Enfield's popular Model R. E. has *everything*—Style, Safety, Economy, Flexibility. 125 c. c. 2-stroke, single cylinder engine; 3-speed gears. *Goes 100 miles per gallon of gas!* 45 m. p. h.! Folder "S" gives you all details. Also 350 c. c. and 500 c. c. models.

Write today *Dealer inquiries given prompt attention.*

WHITEHALL DISTRIBUTORS, Inc.

1385 Commerce Avenue, New York 61, N. Y.

Repair Storm Windows *and* Screens *with* PLASTIC WOOD



When making new screens, or replacing old rusted screen, apply thin layer of PLASTIC WOOD around frame after tacking down screen. This gives greater strength to the frame. PLASTIC WOOD can be easily shaped to match broken molding. Valuable in replacing rotted wood in storm windows.

. . . dozens of other uses

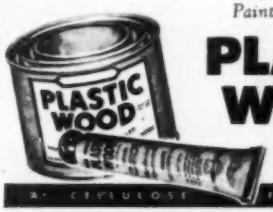
FOR FILLING . . .
- Cracks in floors
- Countersunk screws
- Chipped furniture
- Nail and screw holes

FOR REPAIRING . . .
- Loose tiles
- Loose casters
- Broken balusters
- Broken furniture

- PLASTIC WOOD SOLVENT is indispensable to the home workshop hobbyist for controlling the consistency of Plastic Wood and removing dried Plastic Wood from hands and tools.

T.M. Reg. U. S. Pat. Off.

At all Hardware, Paint and 10c Stores



PLASTIC WOOD

Tube or Can

A CELLULOSE FIBRE FILLER

NEW CROSLEY STATION WAGON

Smart! Practical! Costs $600 to $700 less than any other station wagon—operates for about ½ as much. Seats 4 in comfort. With rear seat removed hauls ¼ ton load.

Convertible: If you love sun and air.

Panel Delivery: Full ¼ ton capacity.

Sedan: Over 20,000 now on the road.

Pickup: Cuts service and delivery costs.

Sports-Utility: For work or play — Rear seat obtainable.—Low priced even for CROSLEY—$130 less than station wagon.

All models have new 4-cylinder engine

CROSLEY

a FINE car

For beautiful, full-color catalog, write: Crosley Motors, Inc., 2532-JN Spring Grove Ave., Cincinnati 14, Ohio.

There's no devil to pay...

FIENDOIL . . . a diabolic enemy of corrosion and friction in small motors! Ask for it . . . use it . . . lubricate with FIENDOIL!

AT YOUR HARDWARE & SPORTING GOODS STORE

McCambridge & McCambridge
BALTIMORE MARYLAND

U. S. NAVY 7x50 PRISM BINOCULARS

with Coated Optics

Used but in EXCELLENT CONDITION

$95

Complete with leather carrying case and sling

Universal, 6x 30 Navy Prism Binoculars, used but in excellent condition, complete with leather case and sling straps..... **$42.50**

With Coated Optics, $10 Extra.

Engineers All Metal Army Type Hand-Sighting LEVELS

$2.00 PRECISION QUALITY

Send $1.25 for 3rd Edition of Gun Digest with our complete catalog of new and used guns, etc. Our separate catalog 25c.

PUBLIC SPORT SHOPS

11 S. 16th St., Phila. 2, Pa. — No COD's

25c Postage Paid in U.S.A.

The Original MOORE'S Educational TOY MOTOR

Patent 1857209

For twenty-five cents you get all parts necessary to build this electric motor, which will make over 6,000 revolutions per minute. It runs on a single No. 6 dry cell battery. Over 3,000,000 Moore Toy Motors have been sold. As an aid to teaching electrical science it is unsurpassed and has been purchased by many schools.

GEORGE W. MOORE INC., 88 Beaver St., Waltham, Mass.

AMAZING BENCH KNIFE *CUTS ANYTHING*

Even Cuts Bolts With Out Hurting Blade

My famous handmade Buck knife has a blade that's tempered by a secret process to last a lifetime. The edge is ground to razor sharpness—cuts anything. Handiest tool on your work bench. Ideal for small game. Send check or money order. Satisfaction Guaranteed or your money back. $5 postpaid.

H. H. BUCK & SON
1272 Morena, San Diego, California

GUNS-SWORDS FIREARMS

Your treasure hunt ends in our new 156 page catalog listing 2500 authentic items, including old pistols, swords, knives, armor, etc. To get your illustrated catalog of over 156 pages, send 50c to cover postage and handling to **ROBERT ABELS, Box PS, 860 Lexington Avenue, New York 21, N. Y.**

WHEELS AT BARGAIN PRICES

...4" wheel & tire, 5/16" sleeve bearing & hub cap	$0.45 ea.
...5" wheel ¾" solid tire 5/16" shaft hole	0.65 ea.
...6" wheel ¾" solid tire 5/16" shaft hole	0.75 ea.
...7" wheel ¾" solid tire ¾" shaft hole	0.85 ea.
...8" wheel 1" solid tire ¾" sleeve bearing	1.25 ea.
...8 x 2" wheel, semi-pneumatic tire 7/16" ball bearing	2.50 ea.
...10 x 1.75 wheel semi-pneumatic tire 7/16" ball bearing	3.25 ea.
...12 x 1.75 wheel semi-pneumatic tire 7/16" ball bearing	3.50 ea.
...10 x 2.50 wheel semi-pneumatic ½" ball bearing	4.50 ea.
...6 x 2" wheel ¾" ball bearing, solid tires	2.95 ea.

BUILD YOUR OWN Wagons, Scooters, Soap Box Racers, Welding Carts, Baby Pens, etc.

To order above wheels write number wheels wanted in space provided, tear out and mail this ad with check or money order and your name and address. If other sizes are wanted write for FREE LIST.

TRULSON MFG. CO., 811 E. 31 St., Dept. 913, Kansas City, Mo.

MAGNETIC JIG SAW READY

NO MOTOR NEEDED . . . JUST PLUG IN

Portable...Safe...Cuts Clean, Smooth!

CRAFTSMEN! PARENTS! Get SYNCRO . . the remarkable, safe, patented magnetic jig saw . . ready for immediate shipment! Use for fun or money making! SYNCRO needs no belt, no gears, no oiling. No rotating motor to buy. Just plug in any 50 or 60 cycle (A.C. only) 110-120 volt wall outlet—in kitchen, attic, basement—set on kitchen table, floor, anywhere—and saw! The high-speed, short Magnetic Safety Stroke Action, and freedom from belts makes SYNCRO so safe small boys and girls may use it. Cuts intricate designs on 5/8" soft wood, 1/2" medium hard plywood and thinner hardwoods, plastics, thin metals. Leaves no ragged undersides on plywood, cardboard. Cuts to center of 27" circle! SYNCRO is the biggest, most powerful, safest—and has the greatest clearance (13 1/2") and largest table top (10" x 10")—of any magnetic jig saw made! Base, 7 1/2 x 6 3/4". Get, enjoy this safe, educational, practical quality tool for making models, displays, puzzles, inlays, silhouettes, toys, whatnots, etc. Limited supply—so hurry!

No. 2000

SYNCRO

DELUXE JIG SAW

For Hobbyists, Craftsmen and Light Production

ONLY $17.50

Prices higher in foreign countries

Shpg. Wt., 18 Lbs.

WHY SYNCRO IS SAFE

SYNCRO has no continuous cutting blade nor "long stroke" blade to pull fingers into teeth—instead there are 14,400 strokes per minute—7,200 short cutting strokes plus 7,200 upward NON-CUTTING, REPELLING strokes! (Fig. 1) SYNCRO will not even CUT wood unless piece is pushed FIRMLY DOWNWARD AGAINST blade and FIRMLY FORWARD—both actions at SAME time! SYNCRO blade teeth cut ONLY on DOWN stroke. (Fig. 2) Teeth raise, repel, push away any object on UP stroke. (Fig. 3) When blade moves UP it KICKS finger away free. On down stroke, blade does not move far enough to accidentally cut finger unless finger is intentionally, deliberately fed into blade like wood is fed in Figure 1. No wonder SYNCRO is the world's SAFEST saw . . . a feature old and young users acclaim!

15 SYNCRO FEATURES

World's safest saw. Portable. No rotating motor needed as self-contained magnetic power unit transmits A.C. magnetic impulses to armature-diaphragm-power transferred to blade. No rotating parts to wear out, 14,400 magnetic strokes per minute. Never needs oiling. Large 10" x 10" table top. Cross section engraved lines on top. Big 13 1/2" throat clearance. Finest steel blades. Rubber feet. 5' cable, plug. Varying voltage adjustment nut. Lifetime durability. Quality materials, workmanship, performance.

Complete With Cord, 3 Blades

SEE YOUR DEALER FIRST

ORDER NOW ON 10 DAY TRIAL

Order with complete confidence on this liberal Trial Offer. When you get your SYNCRO, plug it in and saw, as per directions. Then, if it does not saw cleaner, better than any other jig saw you ever used, and with more safety . . . if it does not satisfy YOU . . . return it undamaged, postpaid and post-marked within 10 days of its delivery date . . . and we will refund the saw price promptly without question!

SAW CORPORATION, Dept. B-38, Rochester, Michigan

Export Address: 120 Wall St., N.Y.C.

WORLD'S LARGEST MAKERS OF ELECTRC JIG SAWS

SYNCRO SAW CORPORATION, Dept. B-38 ROCHESTER, MICHIGAN

Export address: 120 Wall St., N.Y.C.

Gentlemen: Here's my order for one SYNCRO MAGNETIC JIG SAW, Model 2000, Shpg. wt. packed, 18 lbs. $17.50 F.O.B. Factory, Please send it complete with electric cable and plug, 3 blades, on your 10 Days Money Back Trial Offer.

I enclose $17.50 as payment, Please ship saw:

( ) Express charges collect or ( ) Parcel Post charges collect.

( ) Express, for which I enclose an extra $.....

( ) Parcel Post, for which I enclose an extra $.....

Name.....

St. & No.....

City.....

( ) I enclose no money—send FREE SYNCRO Circular.

CUT A FEW KEYWAYS
IN GEARS, CUTTERS, COUPLINGS, COLLARS, etc.
AND YOU'VE PAID FOR THIS KIT!

MINUTE MAN
Keyway Broach Kit cuts any size keyway by hand
IN ONE MINUTE!

Here's a set of fine tools that you'll be proud to own — and that's worth its weight in gold every time you have a keyway to cut.

The ***MINUTE MAN*** Kit and a du Mont Arbor Press give you everything you need to cut a clean, accurate keyway in sixty seconds.

ACT NOW! You're losing time and money every minute you spend cutting keyways by obsolete, expensive machine methods. You need the *Minute Man*.

YOUR NAME and address on a penny postcard will bring you the name of the nearest Minute Man Mill Supply Distributor and copy of the new Descriptive Folder and Price List. "PS."

The du MONT CORPORATION
GREENFIELD, MASSACHUSETTS

VU-VIZOR *The New*
TRANSPARENT PLASTIC SUNSHADE

Enables you to see traffic lights. Also cars ahead while driving down grades. Eases night driving. Designed to conform to contour of your car. Carefully constructed of the heavy transparent plastic used in aircraft. Polished stainless steel brackets hold shade rigid to car. Will not tear or rust. Readily mounted on all models. Shipped complete with all necessary screws, nuts, etc. for easy permanent installation. State make, model and year of car.

$38.95

Send order direct or write for literature
NU-WORLD PRODUCTS CO. F.O.B. Huntington Beach, Calif.
303 Third St., Dept. PS-3, Huntington Beach, Calif.

Thompson BEATS the World on BOATS

Better Built Lower Prices

Safe Boats With Full Length Spray Rails
Keep passengers perfectly dry—even at high speeds. Catalog also shows two new models of "Take-Along" Boats. Two big factories—save you freight.

CATALOG FREE
Write for your copy. State kind of boat in which you are interested.

THOMPSON BROS. BOAT MFG. CO. (182)
219 Ann St. PESHTIGO, WIS. (Write to either place) 119 Elm St. CORTLAND, N.Y.

MASTER CRAFTSMEN
use these finest fillers!

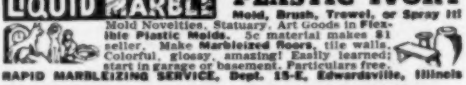
- SAVES TIME
- SMOOTH TEXTURE
- EASIER TO WORK
- SHRINKS ONLY 1%
- STAYS IN

FOR a perfect surfacing job on wood, metal or plastic—use the expert's choice—Duratite. Easy to use—faster—shrinkage is so slight, it fills completely in just *one* application—stays in! 7 wood colors. Ask your dealer or send for large tube.

SEND FOR LARGE TUBE

WEBB PRODUCTS COMPANY
232 S. 6 St., San Bernardino, Calif.
Enclosed find 25c, send large tube Duratite Wood Dough.
Name_____
Address_____
City_____ Zone____ State_____

LIQUID MARBLE **PLASTIC IVORY**
Mold, Brush, Trowel, or Spray It!



Mold Novelties, Statuary, Art Goods in **Flexible Plastic Molds.** 5c material makes $1 seller. Make **Marbleized floors,** tile walls. Colorful, glossy, amazing! Easily learned; start in garage or basement. Particulars free.

RAPID MARBLEIZING SERVICE, Dept. 15-E, Edwardsville, Illinois

BUILD YOUR OWN POWER LAWN MOWER

WHY BREAK YOUR BACK MOWING FIELD OR LAWN?

WRITE FOR FREE LITERATURE
The Rite-Way Mower Attachment

SAVE MONEY SAVE TIME
Now anyone can save time and effort mowing field or lawn by building their own whirl type power mower. Build according to your own ideas and needs at small cost. Cut close to fences, walks, buildings, etc. Build in short time with parts and instructions we furnish. Save hours of time and back breaking labor. Write today for FREE information.

T & H MFG. CO., Dept. H-113
811 E. 31, Kan. City 3, Mo.

BUILD SOUNDLY FOR THE FUTURE WITH Atlas PRECISION TOOLS

AMERICA'S OUTSTANDING BENCH LATHE VALUE

- 10" Swing – 24"–36" between centers.
- Quick-Change Model gives instant selection of 54 threads or feeds.
- Timken tapered roller bearings.
- Precision ground bed.
- 16 spindle speeds—V-belt drive.
- Back gears for extra power.
- Instantly reversible power cross and longitudinal feeds.

Atlas DRILL PRESSES

12¾" and 15" bench and floor models. Extra-heavy head, column, table, and base. Precision-ground table tilts 90° right or left. Exclusive "floating-drive" spindle, with deep-grooved ball bearings. Low-cost accessories for all drill press operations.

Atlas SHAPERS

Handle all shaping operations within a 7" stroke—dovetailing, keyseating, vertical and angular cuts. Timken bearings. 4 speeds. Operates from ½ HP motor.

Atlas MILLERS

Gives you full range of milling operations—slabbing and facing cuts, end milling, keyways, boring, layout work. Timken bearings. 8 spindle speeds. Operates from ⅓ HP motor.

Whether you have a thriving commercial or automotive shop — or are increasing the usefulness of your home shop — Atlas tools are a sound investment.

Industrial plants and commercial operators get all the speed, versatility, and precision of expensive machines in small space, *at low cost.* Auto repair men find 44 profitable jobs for an Atlas lathe. Home shop owners save many dollars a year on home equipment repairs and many types of home furnishings. And if your home shop interest is profit-wise — for developing your own business — Atlas tools are ideal research and production equipment.

Years of dependable service are engineered into every Atlas tool. They are heavily and ruggedly built — by the latest low-cost precision methods. Today's values are outstanding! See them at your Atlas distributor's. Send the coupon for complete details.

ATLAS PRESS COMPANY

355 N. PITCHER STREET • KALAMAZOO, MICHIGAN

Send for FREE LITERATURE

ATLAS PRESS COMPANY,
355 N. Pitcher St., Kalamazoo, Mich.

Please send latest information about Atlas tools. I am especially interested in:

☐ 10" lathe ☐ 6" lathe ☐ drill presses
☐ Miller ☐ Shaper ☐ Also woodworking tools.

Name_____

Address_____

City, State_____

BUILD YOUR OWN BOAT

With EASI-BILD* Pattern Method!

Easy... Inexpensive... Better! You can build this 11½ ft. boat yourself. Just trace pattern on wood; saw, and assemble. Step-by-step directions, assembly illustrations, plus *Cascophen*, the new completely durable, waterproof glue, make it easy.

Get pattern and *free* illustrated folder at your hardware store or send coupon below to:

*Trade-Mark © 1948, Easi-Bild Pattern Co.

Casco Pattern Dept. PS-38,
P.O. Box 215, Pleasantville, N. Y.
☐ Enclosed is $1.00 for Utility Boat Pattern #85.
☐ Send FREE folder illustrating 100 patterns.
Name_____
Address_____
City_____ Zone____ State_____

Choose the right glue for the job!

Boats, outdoor furniture, sports equipment—joints that must withstand outdoor exposure—*Cascophen* (Resorcin Resin Glue). The first completely durable glue available to homecraftsmen.

For furniture, toys, heavy-duty home repairs—strong, stainfree, moldproof, highly water-resistant *Cascamite* (Urea Resin Glue). Mixes quickly with cold water!

For models, photo prints, labeling—general home, school, or office gluing, use the new, clean, white, fast-setting *Cascorez* (Polyvinyl Resin Glue). Liquid, ready to use!

FOR FREE GLUING CHART WRITE:

Casein Company of America, Dept. PS-38,
350 Madison Ave., New York 17, N. Y.
Please send me *free* Gluing Chart which gives full details in choosing the right glue for the job.
Name_____
Address_____
City_____ Zone____ State_____

CASEIN COMPANY OF AMERICA
Makers of Casco Glues

FOREDOM FLEXIBLE SHAFT MACHINE

only **$19.95**

with PENCIL SIZE HANDPIECE
for Finger-Tip Control

Works effortlessly and with marvelous ease. Tens of thousands of users attest to its infinite superiority over other small grinders. Affords you vastly more satisfaction and fun.

5 REASONS WHY FOREDOMS ARE TOPS IN THE FIELD:

1. Extra power and longer motor life because motor not dwarfed to fit hand. 2. Correct handpiece size for deft, sensitive, finger-tip control. 3. No obstructed view of your work. 4. Freedom from gyroscopic action—hence better work. 5. Small handpiece size lets you get into hard-to-reach places.

HUNDREDS OF USES

Foredoms handle hundreds of tasks. Use them for pleasure or profit, for tinkering or expert craftsmanship. Their versatility is unlimited. Use them to grind, polish, mill, engrave, sharpen, slot, rout, saw, carve, clean, sand, etch, cut, etc. Ideal for internal carving of plastics, the astounding new craft. You can work on wood, glass, plastics and all metals with a Foredom.

OVER 60,000 FOREDOMS NOW IN USE

The power grinder you'll eventually buy if you want true operating ease and results which genuinely satisfy. Foredom's quarter century experience in building fine tools for home and industry is your assurance of superior performance.

Order your Foredom today, direct on 10-day trial. Send check or M.O. for $19.95 (price not increased since OPA) and we send postpaid in U. S. or send $2.00 and you pay postman balance plus postage. 50-piece accessory set $1.50 extra. Catalog on request.

FOREDOM ELECTRIC COMPANY, Dept., F-104
27 Park Place New York 7, N. Y.

NEW! BETTER!

AIR-COOLED CARBURETOR INTAKE STACK! FOR 2⅝" CARBURETORS

Soup-up performance!
Increase Mileage!
Low Price, only..... **$2.00**
(Includes Postage)

Send Cash, Check, Money Order to:
MERCURY TOOL & DIE COMPANY
8077 Washington Blvd. Culver City, Calif.

OLD GOLD JEWELRY WANTED

Dental gold teeth, plates and bridges with metal attached. Any broken pieces of gold jewelry. Immediate payment and free mailing container to you or your friends upon request.

LOWES, DEPT. PS Holland Bldg., St. Louis 1, Mo.

New STEEL ADJUSTABLE BRACKETS & STANDARDS For HEAVY DUTY SHELVING

LOCKS IN PLACE—EASY TO ADJUST UP OR DOWN

Standards are bolted or screwed into wall vertically. Brackets readily slide into place and are safely locked by patented principles. Can be raised or lowered 1½" variation. Rearrangement of shelving requires very few minutes. You can build mass displays for stores in a Jiffy. Homeowners will find this the neatest, easiest to install shelving available. Ideal for workshop, garages, filling stations, etc. Finest Shelving Equipment available. Inexpensive — will last a lifetime. No special tools required for installation.

BIG PROFITS FOR SALES AGENTS

Earn big profits installing JIFFY EQUIPMENT in your neighborhood, spare or full time. Write for complete details and prices.

JACKSON MFG. CO. Dept. PS2, 622 East Third St. Kansas City 6, Mo.

Save Money FREE

KITS for Amateurs and Experimenters

RADIO CATALOG AND SUPPLEMENT

Build it yourself.

Thousands of radio values in this big book — Radios and radio phonographs, F.M., P.A., Ham Xmitters, receivers, kits, thousands of parts — whatever the job calls for Lafayette has it. And every item priced way down, to save you money!

RADIOS
KITS
HAM
P. A.

Lafayette Radio

RADIO WIRE TELEVISION, INC.

100 Sixth Ave., N. Y. 13 • 542 E. Fordham Rd., Bronx 58
110 Federal St., Boston 10 • 24 Central Ave., Newark 2, N. J.

LAFAYETTE RADIO, Dept. KC-8
100 Sixth Ave., New York 13, N. Y.
Rush catalog #88 ☐ *Flyer #C41* ☐

Name.....
Address.....
City.....Zone.....State.....

AGENTS
300% Profit

SIGN LETTERS

For Store Fronts and Office Windows. Anyone can put them on. Free Samples. Liberal Offer to general agents.
METALLIC LETTER CO., 441 N. Clark, Chicago 10

"YANKEE" VISES

hold work through every step without a misstep

Any job locked in a "Yankee" Vise, is correctly positioned for every operation . . . hand or machine. Lifts on and off swivel base at bench. Machined accurately . . . top, bottom, sides and front end . . . V-grooved block for rounds. Four sizes, with and without swivel base . . . 1½", 2", 2¾" and 4" jaw widths. At your dealer's.

Write for "Yankee" Tool Book

NORTH BROS. MFG. CO.
Philadelphia 33, Pa.

YANKEE TOOLS NOW A PART OF STANLEY
THE TOOL BOX OF THE WORLD

What's Extra Protection Worth to You?

★ You get more miles from your car, more life from your engine, with Casite's extra protection.

Casite cuts engine wear because it improves lubrication—gets oil around quickly and into the tight spots. Casite retards formation of sludge and gum . . . keeps your motor clean and free-running . . . guarantees Better Motor Performance or Double-Your-Money-Back.

Get Casite today. The Casite Corporation, Hastings, Michigan, and the Casite Division, Hastings Ltd., Toronto.

75¢ A PINT—95¢ in Canada

BETTER MOTOR PERFORMANCE
OR DOUBLE-YOUR-MONEY-BACK

If you love fine tools, we dare you to look at this drill

YOU CAN'T GO to your hardware store, see this new Millers Falls tool, heft it, grip its smooth, warm handle, spin its drive gear . . . *and come away without wanting it for your own!*

This is the new Millers Falls No. 104 Hand Drill . . . and if you know Millers Falls Company at all, you know it *must* be right. We don't take tools lightly. A new tool has to be *right* — in performance, in durability, in value — or it has no place in our line.

This new tool *is right.* Long planned and released now to celebrate the company's eighty years of toolmaking, it's the finest hand drill we've ever made.

See it — if you dare — at your hardware store. Millers Falls Company, Greenfield, Mass.

NO MERE DIE-CAST GEARS but *machine-cut;* cast iron drive gear meshes smoothly with steel pinion to deliver trouble-free performance year after year.

EASY-GRIP HANDLE of tough, durable plastic. Contains 8 drill points; long enough to hold standard twist drills.

"OILITE" SPINDLE BEARING with ball thrust.

NEW TRUE-RUNNING ¼" CHUCK; 3 hardened jaws.

Millers Falls Tools

Celebrating 80 Years of Toolmaking

---

for home or shop

THE JIFFY all metal CABINET

THE HANDY WAY TO KEEP SMALL PARTS, WASHERS, NAILS, SCREWS, NUTS, BOLTS AT HAND

DRAWER SIZE
1¼" Deep
3" Wide
6" Long

CABINET SIZE
32 Drawer Unit
6" Deep
12¾" Wide
15¼" High
Shipping Weight approx. 9 lbs.

64 Drawer Unit
6" Deep
25½" Wide
15¼" High
Shipping Weight approx. 18 lbs.

For small items, the low-cost Jiffy Cabinet, 32 or 64 drawer units that put office, shop, work bench, household and hobbyist needs at your fingertips. Metal flange drawer guides. Spot welded all metal cabinet with sturdy laminated drawers insures long time-saving service. Why fumble? With the Jiffy you know where it is. 32 drawer unit—$4.95; 64 drawer unit—$8.95. Send check or money order—No C.O.D.'s please. Ohio orders please add 3% Sales Tax.

KAYTEE PRODUCTS
Dept. 5 • Box 588 • Canton, Ohio

SPECIAL BARGAIN PRICES IN

SETS OF CARBON TAPS & DIES

consisting of one each of tap & die 1/72, 2/64, 3/48, 4/48, 5/40, 6/32, 8/36, 10/32, 12/24, (dies 13/16 O.D.) complete with Tap Wrench and Die Stock. **COMPLETE $8.00**

Write for prices & Sizes of individual taps & dies. Enclose 3c for postage.

WE BUY ALL SURPLUS TOOLS

SEND FOR FREE CIRCULAR

SID TOOL CO., Dept. S1, 183 Grand Street, N.Y.C.

Build Your Own arc welder

For light or heavy work, 75-200 amperes. Complete **PLANS, 35c.** Send today and we'll include **FREE** our big new catalog. **LEJAY MFG. CO., 1323 LeJay Bldg., Minneapolis 8, Minn.**

SAVE MONEY

build your own

SMITH COMPRESSOR

Now, use the world-famous Smith Air Compressor to operate rock drills, paving breakers, spray guns, sandblasting, etc., at low cost! Just order the Smith Compressor Head and Accessories with complete instructions for assembling. All you need is a Ford Motor and shop facilities. Capacity 60 cu. ft.—ample power for most compressor jobs. Pressure up to 100 lbs. per square inch. Head equipped with high speed compressor valves; automatic unloading and idling.

WRITE TODAY! **GORDON SMITH & CO., Inc.** 405 College Street Bowling Green, Ky.

ATTENTION FARMERS!

Now is the Time to Get a **SEAMAN ROTARY TILLER** *for Your Spring Work*

Speeds up tillage; makes better seedbed; use for finishing seedbed prepared with conventional equipment or for complete seedbed preparation with this ONE machine. Provides ideal tillage control — fine pulverization, coarse, or medium to suit soil and crop conditions. Promotes higher yields . . . holds more moisture, longer; mixes fertilizer and green manure into GROWING AREA of seedbed; hastens germination; aerates seedbed; helps control weeds, grubs and many other crop pests; reduces wind and water erosion; makes plants more drought-resistant. Available in complete range of sizes from 3 ft. to 7 ft. tillage widths, power take-off and motorized (gas or diesel) models. See Your Seaman Tiller dealer and write for complete descriptive literature.

SEAMAN MOTORS, Inc. 365 N. 25th Street Milwaukee 3, Wis.

LATHE ACCESSORIES

• New Time and Money Saving Items for your Metal Working Lathe—Lathe Mandrels in sets with a new and unusual feature—Center Drill Arbor sets—Stub Mandrels—Dual-Purpose Ball Bearing Cone and Pipe Centers for auto and electric motor Armature and Pipe and Tubing Work—Extra Long Hardened Centers—Extra Long Cut-Away Centers — Morse Taper Reamers—Drill Rod—Flat Gage Stock—Case Hardening Compound—Etc.

FREE! Illustrated folder and price list. Mention your lathe. Write Today.

HURON MACHINE & TOOL CO.
Yale 3, Michigan

WRITE for CIRCULAR

HARGRAVE SUPER JUNIOR CLAMPS

INDIVIDUALLY TESTED

Made right to last longer

Forged-steel, heat-treated frames make these small 'C' clamps far stronger than malleable or other cast clamps. Economical...suitable for all classes of work . . . they're built to take it! Openings 1" to 3".

At Hardware and Mill Supply Dealers Everywhere.

Write for Catalog of Complete Line.

1955 Waverly Ave. Cincinnati 12, Ohio

The **CINCINNATI TOOL** *Co.*

HOW MUCH ARE YOU MISSING?

● Are you getting the most out of your life . . . your business? Or are you handicapped needlessly because of FAULTY HEARING?

Thousands of the deafened now enjoy NEW HEARING HAPPINESS—thanks to Western Electric's two new all-in-one hearing aids, designed by the famed Bell Telephone Laboratories.

See and hear them at your local Western Electric Hearing Aid dealer's (address in Classified Telephone Directory). Or send coupon today for valuable free booklets.

Model 65—Specially designed for those with moderate hearing loss. All-in-one, compact, convenient, economical.

Super 66—The ideal hearing aid for the severely deafened. All-in-one; gives extra power, superb fidelity.

Western Electric Hearing Aids

THE ONLY HEARING AIDS DESIGNED BY BELL TELEPHONE LABORATORIES

FREE! **MAIL THIS COUPON TODAY**

WESTERN ELECTRIC, Dept. 380-PS3
195 Broadway, New York 7, N. Y.

Send me free booklet about two new *all-in-one* Western Electric Hearing Aids plus "Modern Science and Your Hearing."

Name_____

Address_____

City_____

Zone_____ State_____

Distributed in U. S. A. by Graybar Electric Co.; in Canada by Northern Electric Co; Ltd.; in other countries by Westrex Corporation.

Action

YOU'VE NEVER EXPERIENCED BEFORE IN A ROD

That's what experienced anglers say about the *No. 411 South Bender*. It has an action all its own that adds a new thrill to bait casting. Controlled flexibility produces a live suppleness that gives just the right whip for perfect, effortless casting.

No. 411 SOUTH BENDER ROD

The solid tip is machined from a new, high-strength metal alloy . . . and it weighs *only* 3½ ounces. Foolproof reel and tip locking device. Maroon trim. Length 4 feet, 11 inches **$15.**

PERFECTORENO REEL

No thumbing—no backlashes. Makes casting easy and a real pleasure. **$10, $11,** and **$13.50.**

LEVEL-WINDING ANTI-BACK-LASH REEL

A favorite with casters. Built for long, hard usage. Precision-built. **$5.60, $8.50, $9.50, $11** and **$15.**

BLACK-ORENO LINE

The bait casting line you can trust. Braided of nylon. **$1.35** to **$2.50** per 50 yard spool. Silk slightly higher.

No. 973 BASS-ORENO

Famous fish-getter. World's greatest bait **$1.10.** Also 4 smaller sizes **65¢** to **95¢.**

FREE! NEW '48 BOOK ON FISHING

"Fishing — What Tackle and When" shows South Bend and Oreno tackle. Color pictures of fishes. Fly and bait casting instructions. Every fisherman needs a copy. Write for your copy today. Sent FREE!

SOUTH BEND BAIT CO.
892 HIGH ST., SOUTH BEND 23, INDIANA

BETTER FISHING INC.

SOUTH BEND

A Name Famous in Fishing

MAKE $ MORE MONEY

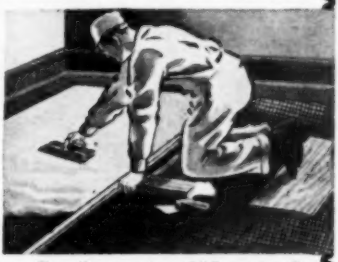
Applying or Selling

CORKSTONE

A General Purpose Magnesium Oxychloride Flooring

THE MODERN PLASTIC FLOORING

EASY TO APPLY
Here's your opportunity to get into business for yourself applying or selling Corkstone, the economical, top-grade plastic flooring. Plenty of profit. Act without delay!



Dealers & Agents Wanted
WRITE FOR DETAILS

LASTING PRODUCTS COMPANY
200 Block S. Franklintown Rd., Baltimore 23, Md.

CARBURETOR TOO RICH

MAKES MOTORIST TOO POOR

Car owners who are wasting money and not getting proper gas mileage due to over-rich mixtures will be pleased to learn how to save gasoline by VACU-MATING over-rich mixtures. VACU-MATIC fits all cars, trucks and tractors. It is *automatic* and operates on the supercharge principle. Easily installed in a few minutes.

SALESMEN WANTED! Big Profits! Send name, address on penny postcard for *free particulars* and how to get yours for introducing.

VACU-MATIC CO., 7617-1310 W. State St., WAUWATOSA, WIS.

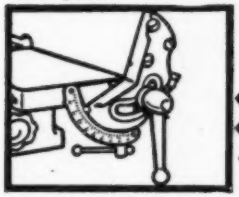
STOPS LEAKS *PERMANENTLY*

Cut your fixture replacement, water and fuel bills with Economy Renewable Seats. Make economical, permanent repairs quickly and easily with the Junior Kit (illus.). Repair bathroom, kitchen and laundry fixtures. Everything you need included in steel box. This is a natural for the "Fixit" shops—get extra income from making permanent repairs on your customers' faucets.

Senior Master Kit also available—repairs faucets and valves up to 1" pipe. *At better Jobbers and Hardware Stores . . . or Write Direct.*

ECONOMY VALVE SEAT CO.
2811 W. Fletcher Street Chicago 18, Ill.

Rabbets a full ¼" deep can be cut at one pass of the work. Firm rest provided by heavy cast rabbeting arm.



Fence-tilting mechanism is provided with accurate scale that shows exact angle of tilt.

Knife guard completely covers knives, and slides back out of the way with the work. It is instantly removed for rabbeting and as quickly replaced.

HOMECRAFT® 4-inch Jointer

No. 37-110

—an economy-priced tool built especially for the home woodworker

Only $29.95 (without motor)

With this surprisingly low-priced No. 37-110 *Homecraft* Jointer, you can plane any piece of wood up to 4" wide — smoother and faster than by hand. You can plane the edges of boards true, straight, and square, so that they can be joined together perfectly. And you can cut ¼" rabbets. You eliminate all the drudgery of hand planing.

A Lot for the Money!

The *Homecraft* 4-inch Jointer has features that make it just as fine a hobby-shop jointer as can be built for its moderate price:

- Solid-steel cutterhead runs in lubricated-for-life ball bearings.
- Fence is accurately-ground casting heavily ribbed for rigidity.
- Fence securely locks in place anywhere across the table.
- Fence tilts 45 degrees to right and left.
- Tables are finish-ground after assembly, to get the true alignment necessary for good work.
- Both tables are adjustable.

See It At Your Dealer!

Ask your *Homecraft* dealer to show you the No. 37-110 jointer, and his complete display of *Homecraft* Power Tools that range in price from $29.95 to $41.95.

Visit your *Homecraft* dealer now!

HOMECRAFT® POWER TOOLS

General Sales Office — Chicago 2, Ill.

Descriptive Literature! Shows all Homecraft Power Tools and accessories. Sent to you free. Use coupon, for your copy.

HOMECRAFT POWER TOOLS

are built by the makers of Delta-Milwaukee* Power and Machine Tools — the tools with a widespread reputation for safety, accuracy, and dependability, in factories and schools, as well as home shops.

If your goal is a shop equipped with power tools that embody the most advanced principles of engineering, design, and construction, then insist on Delta-Milwaukee Power Tools. See your dealer.

*Trade Mark Reg. U.S. Pat. Off.

Tear out coupon and mail today!

DELTA MANUFACTURING DIVISION
Rockwell Manufacturing Company
683C E. Vienna Ave., Milwaukee 1, Wis.

Please send descriptive literature on Homecraft Power Tools.

Name_____

Address_____

City_____ State_____

HM-55A

"Best Results with Jitterbug"

"Fred Arbogast Co.: Your Jitterbugs caught these bass at Indian Lake, New York. They weighed 6¾ lbs., 6, 5¼ and 4 lbs. each. We use many of your baits but have best results with the Jitterbug." Fred & Bill Tripton, Maybrook, New York.

Fascinating Action!

Jitterbug's exciting surface action fascinates fish and fishermen. Bass strike it furiously. And the action is right on the surface where you can see, hear and feel it. These noisy wobblers take bass day or night. Many northern pike and occasionally muskies are caught on Jitterbugs. Try them.

$1.21 ea.

Choice of 6 colors. At your dealers.

Send for Free Catalog

FRED ARBOGAST & CO., INC.
1723 North St., Akron, O.

SOUTH BEND

QUALITY LATHE DOGS

Heavy malleable iron. Tail shaped to fit face plate slot. Standard Dog has square head screw. Safety Dog has headless screw. Prices for either style.

Capacity	Price*	Capacity	Price**
½"	$0.80	½"	$0.70
¾	.95	½	.75
1	1.05	¾	.90
1¼	1.20	1	1.00
1½	1.40	1¼	1.10
1¾	1.55	1½	1.35
2	1.70		
2½	1.95		
3	2.20		
3½	3.00		
4	4.00		

*13-inch or larger lathes.
**9-inch and 10-inch lathes.

SOUTH BEND LATHE WORKS 456A E. Madison St. South Bend 22, Ind.

If you stop, look and listen, we can show you how to build a business of your own NOW with Tradio, the radio functionally-designed for coin operation in hotels, tourist camps, restaurants, taverns, etc., in your community. Hundreds of men and women are entering this new depression-proof business daily. It's a natural for big earnings and a steady income. Tradio has pioneered in this flourishing postwar industry. Only a small investment is needed to get in on the ground floor.

WRITE Dept. O-3 for complete information and free illustrated brochure.

TRADIO, Inc. ASBURY PARK NEW JERSEY

WOOD WORKERS

Lumber—Plywood Available

Harold Hunt wants to send you big new No. 15-A Catalog. Over 148 pages of woodworking ideas. 12 pages of rare woods in colors. UNEQUALED BARGAINS in imported and American woods, supplies, hard-to-find hardware. Send only 15c to cover postage and handling.

CRAFTSMAN WOOD SERVICE CO.
2729 S. Mary St., Dept. 8-81 Chicago 8, Ill.

only 15¢

BUILD YOUR OWN FAST FREEZER

PLANS $1

It's easy to build this household appliance with LeJay Plans. Made from new or used parts. Save up to 75%. No expert knowledge needed. Plans show 5 sizes and are easy to follow. All details clearly explained. Enjoy making one of these freezers. Mail $1 for set of plans and catalog. LEJAY MFG. CO., 423 LeJay Bldg., Minneapolis 8, Minnesota

5 sizes 8 to 40 cu. ft.

WRITE FOR YOUR FREE COPY OF THE NEW KRW HYDRAULIC PRESS BOOK

Describes all manner of Production and Shop Work on KRW Hydraulic and Bench Type Arbor Presses. 32 pages illustrating the new KRW Hand-operated, Electric-operated and Air-operated Hydraulic Presses.

Write for your copy today.

K. R. WILSON, DEPT. 54, 215 MAIN ST., BUFFALO 3, N. Y.

Above: Cushman Package-Kar

Right: The popular Cushman Solo Model, favorite of men and women everywhere

"Don't truck it, scoot it!" Stores, businesses, factories, farms, dealers, service stations—here's the biggest little delivery truck you ever saw, the Cushman Package-Kar. Hauls 8 cu. ft. of packages. Costs less than 1c per mile to operate. Powered by famous Cushman "Husky" engine. Balloon tires, springs, lights the equal of any fine car. Thousands in use in all types of business.

Cushman Engines

For 47 years Cushman has produced high quality small air-cooled and water-cooled engines. These engines are available to original equipment manufacturers and other users. Write for details.

FREE illustrated folders and name of nearest Cushman dealer on request. Ask about generous new

TIME PAYMENT PLAN

CUSHMAN MOTOR WORKS, INC., Dept. S-300, Lincoln, Nebr.

ELECTRICITY *Anywhere*

for HOMES FARMS SHOPS BOATS RADIO USE

● Onan gasoline-engine-driven Electric Plants supply reliable, economical electric service for any use. Portable, stationary or stand-by models. Water or air-cooled, compact and rugged.

A.C.: 350 to 35,000 watts in all standard voltages and frequencies. D.C.: 600 to 10,000 watts, 115 and 230 volts. BATTERY CHARGERS: 500 to 3,500 watts, 6, 12, 24, 32 volts.

Write for folder

D. W. ONAN & SONS INC.
2781 Royalston Ave., Minneapolis 5, Minn.

Onan PRODUCTS

CONVERT HAND MOWERS TO POWER MOWERS

Takes less than 3 hours

The Handy Dandy Lawn Mower Kit fits any hand mower from the 16 to the 20 inch size. Complete with all necessary parts. Kits can be purchased separately or complete with power units.

Maytag Kit Completely Assembled

DEALERS WANTED

LE CLAIRE MFG. CO. LE CLAIRE, IOWA
Mfg. of Handy-Dandy Aluminum Clothes Pole

---

not just one strong point but . . .

STRONGER AT ALL POINTS

STANLEY No. 923 BIT BRACE

Look at the Stanley 923 Bit Brace in a workman's tool box. It's probably taken years of hard work, rough use . . . and got little care. Yet it's still a fine tool . . . accurate, smooth working. Steel clad hardwood head turns freely on ball bearings and bronze bushings. Chuck assembly locked in place with perforated nut, cotter pin and slotted screw end. Heavy duty, all steel box ratchet. Universal jaw takes round and tapered shanks, all sizes of auger bits and twist drills up to ½". More tool for your money.

COUPON brings you Two books for your shop shelf

One is FREE! The other, the latest edition of a famous textbook for the home workshop, cloth-bound, fully illustrated, just $1.00.

THE TOOL BOX OF THE WORLD

STANLEY

Reg. U.S. Pat. Off.

HARDWARE · HAND TOOLS · ELECTRIC TOOLS

Stanley Tools, 238 Elm St.
New Britain, Conn.

Please send by return mail:

☐ FREE booklet: "The Joy of Accomplishment."

☐ 188-page book: "How to Work with Tools and Wood." $1.00 enclosed.

(In Canada: Send order to Stanley Tool Co. of Canada, Ltd., Roxton Pond, Quebec.)

Name.....

Address.....

City..... *State*.....

Everything in Radio at Lowest Prices

Get ALLIED'S *new* Catalog—biggest and most complete in Radio! Tremendous values in new Television receivers, home radios, latest Amateur receivers and station equipment, new builders' Kits, Sound Systems. Thousands of parts, tubes, test instruments, tools, books and diagrams—the world's largest stocks—all at money-saving low prices! Send for your FREE ALLIED Catalog today.

HERE'S A TYPICAL ALLIED VALUE!

A Quality Electric Drill Kit at a Big Savings

A wonderfully handy tool for light-duty, intermittent service in every shop. This sturdy ¼" drill comes complete with 14 popular size drills for wood, plastics, iron and steel. Dependable AC-DC motor operates efficiently at 1100 rpm. Has self-lubricating oilite bearings; heavy chuck; built-in on-off switch and 7 foot cord and plug. Entire unit is balanced for easy, non-tiring work even in close quarters. For 115 volts AC-DC. An outstanding value. **46-027** (FOB Chicago) **ONLY $15.95**

GET THESE VALUABLE *ALLIED* RADIO BOOKS!

Radio Formulas & Data No. 37-752.....10c
Dictionary of Radio Terms No. 37-751...15c
Radio Circuit Handbook No. 37-753.....25c
Radio Builders' Handbook No. 37-750...15c
Simplified Radio Servicing No. 37-755...10c
Radio Data Handbook No. 37-754.....25c
ALL 6 BOOKS above No. 37-799.....$1.00
Parallel Resistance and Series Capacitance Calculator. No. 37-960....25c
R-F Resonance and Coil Winding Calculator. No. 37-955.....25c

ALLIED RADIO

ALLIED RADIO CORP.
833 W. Jackson Blvd., Dept. 7-CC-8
Chicago 7, Illinois

FREE Catalog

☐ Send FREE New ALLIED Catalog
☐ Send Drill Kit No. 46-027
☐ Send 6 Books No. 37-799
☐ Send Calculator No. .....
} $.....enclosed

Name.....
Address.....
City.....*Zone*....*State*.....

ASSEMBLE *King Midget*

Practical, safe, low cost Highway runabout with all the snap and looks of the finest midget track racers. Home assembly keeps cost low. Just bolt together from our factory built parts. Immediate delivery. See how easy it is: 24-page assembly book, drawings, photos, blueprints. Plus detailed illustrated circular $1 (refunded first order). Circular only—25c.

MIDGET MOTORS MFG. CO. *Athens, Ohio*

DEEP TONE
Dual Mufflers
for Ford, Mercury

Scientifically designed straight-thru muffler reduces back pressure. Greater power, speed, and economy. NEW brilliant Deep Tone makes your car standout. Heavy blowout-proof construction. Rugged steel tube throughout (No aluminum).

Simplified Installation. No cutting, no holes to drill. Rubber mounted clamps eliminate usual rattle. Complete with all necessary fittings, etc. Order direct and save. State year and model. Sent C.O.D. from Los Angeles. Price $20.

"Deep Tone" single muffler for Chevrolet, Ford, Plymouth—$4.95.
All other makes—$5.50. Chrome tail pipes, 2½" dia. $1.75

ADVANCE MUFFLER CO.
6800 S. Vermont, Dept. PS-38, Los Angeles 44, Calif.

ONE-MAN SAWMILL LESS THAN $200.00
Easy To Turn Trees Into Money

Makes Lumber ties, shingles, grates, lath, stadding.

BELSAW MODELS in 10 to 24 foot saw. ing lengths. **MECHANICAL FEED,** accurate set works and positive dogs. Use tractor or old auto engine for low cost power. Thousands used for commercial sawing. Pays for itself quickly. Send post card today for **FREE** booklet, "How To Make Lumber" and Catalog of Woodworking Equipment.

BELSAW MACHINERY COMPANY
7848-L Field Bldg., 315 Westport Rd., Kansas City 2, Mo.

On the Level...
It's **EMPIRE** *for Craftsmen!*

No. 151 ALUMINUM LEVEL

The world's standard aluminum level gives you dependable accuracy. Precision milled edges. Has interchangeable glasses — two levels, two plumbs, two 45° finders. Three sizes: 18", $6.00; 24", $6.50; 28", $7.00.

No. 26 TORPEDO LEVEL $2.00

Not a toy but a real level with level, plumb and 45°. Rounded ends prevent ripping pockets. Only 9 inches long. Light-weight aluminum — speedy, convenient.

Your dealer stocks EMPIRE Levels. Write direct for information.

EMPIRE LEVEL MFG. CO.
BOX 97, DEPT. 707, MILWAUKEE 13, WISCONSIN

When you want to fix things fast . . . remember Weldwood Glue. It's quick to mix . . . easy to use . . . tremendously strong . . . stain-free . . . rot-proof . . . and permanent. At hardware stores, lumber yards, chain stores.

WELDWOOD
PLASTIC RESIN
WATERPROOF GLUE

United States Plywood Corporation, New York 18, N. Y.

ATTENTION! FORD AND MERCURY OWNERS
1941 TO 1948

FLOOR & RUNNING BOARD LIGHTS

Easy to Install • No Holes to Drill • Completely wired with bulb—Ready to Install • When door opens, light illuminates floor and running board • Specify whether for Right or Left side.

$2.75 each
$5.00 pair postpaid

If C. O. D. pay Postman $2.75 plus postage
SEND CHECK OR MONEY ORDER TO:

L. L. KRASNY & CO. • 1850 E. 18 St. • Cleveland 14, O.
DEALER INQUIRIES INVITED

The CLINTON Gas Engine

2 H.P.— $59.50
3 H.P.— $74.75

● Complete, compact, dependable, 4 cycle, single cylinder, air cooled gasoline engines—by world's largest producer of 2 H.P. gas engines. Ideal for power tools, saws, farm machinery, pumps, boats, bikes, etc. A penny postcard brings you full information. Immediate Delivery.

FOUR MODELS: Kick starter • Thrust bearing type Gear reduction • Marine type

FREE: Literature describing all uses. Write today.

CLINTON ENGINE CO.
16353 E. Jefferson Detroit 30, Mich.

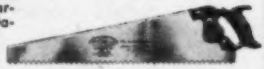
ATKINS

Atkins No. 400 Straight Back—Superbly balanced blade has mirror polish, ribbon edge. Solid rosewood handle in Perfection pattern that prevents wrist strain. Segment ground 5 gauges for easy clearance. Carefully hardened and tempered. Filed and set ready for use. Ship point pattern.

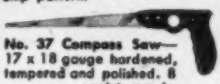
It's easier to achieve the fine workmanship that doubles the pleasure you get from your home workshop if you use Atkins Saws. Atkins have the balance and design that make them handle better—the extra keenness that means faster, cleaner cutting. Because they are made of "Silver Steel"—Atkins' special saw steel that takes a keener edge and holds it longer—it takes fewer sharpenings to keep an Atkins cutting smoothly for longer periods. There's an Atkins for every workshop need. To get the most in sawing satisfaction, get Atkins.

4 FAVORITES FROM THE COMPLETE ATKINS LINE

No. 65 Straight Back—Fine quality suited to general carpentry. Segment ground, Damaskeen polish blade, filed and set for use. Carved apple handle. Ship pattern.



No. 2000 Straight Back—Light but stiff tempered blade, segment ground, polished and etched. New "Perfect-Grip" apple handle is close to blade for easy handling. Ship pattern.



No. 37 Compass Saw—17 x 18 gauge hardened, tempered and polished. 8 points per in. Filed and set. Plastic handle.

No. 39 Keyhole Saw—Ground 18 x 19 gauge for easy clearance with minimum set. 10 points per inch. Uniform temper. Filed and set. Plastic handle.

ATKINS

E. C. ATKINS AND COMPANY
INDIANAPOLIS 9, INDIANA

Now! A NEW POWER KING 9" WOOD LATHE

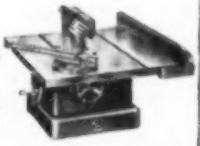
ONLY $37.75

VALUE PLUS — you get it in this new Power King 9" wood lathe! Handles all inboard and outboard wood-turning . . . table legs, chairs, circular tables, lamps, etc. . . . quickly, easily, *accurately*. With proper attachments, turns light metals and plastics as well. Oilite bronze bearings support spindle. Ball bearing absorbs end thrust. Built extra-heavy for smooth operation and lasting accuracy. Send for full details and name of nearest dealer today.

POWER KING 12" DRILL PRESS $39.75

Another top tool value! Rugged, smooth, accurate. Drills wood, metals, and plastics. Has low-cost accessories that help you get real "professional" results on such jobs as mortise and tenon joints, routing, shaping, sanding, carving, inlaying. Send coupon for complete information on this handy precision tool.

POWER KING 7" — 8" TILT/ARBOR SAWS $42.75 and $58.75



All prices F.O.B. Warsaw, less motor. Subject to change without notice.

POWER KING TOOL CORP.
DIVISION OF ATLAS PRESS CO.

SEND FOR FREE LITERATURE TODAY

POWER KING TOOL CORP.,
335 Cleveland St., Warsaw, Ind.
Please send new Power King catalog sheets to:
Name_____
Address_____
City, State_____

SOUTH BEND

TURRET TOOL BLOCK

Square turret indexes within .0005". Rocker adjustments provided for tools. Mounts on cross slide. Fits current model South Bend Lathes, adaptable to others. Write for dimension sheet.

Size Lathe	Size Sq.	Takes Tools	Prices *	Prices **
9"	3"	⅛" x ⅜"	$40	$45
10"	3"	⅛" x ⅜"	40	45
13"	3"	⅛" x ⅜"	—	50
14½"	4"	⅜" x ⅜"	—	70
16"	4"	⅜" x ⅜"	70	75

* Double Tool Cross Slide Model
** Compound Rest Cross Slide Model

SOUTH BEND LATHE WORKS 456A E. Madison St. South Bend 22, Ind.

BUILD YOUR OWN TRAILER

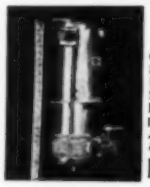
Get these Modern Complete Plans

Select just the model you want—for hunting—travel—camping—or as a home. Each plan is complete with simple, step-by-step instructions and a bill of materials. Easy to follow. Three models!

STOCK No. H27 NATIONAL MODEL 27. A sleek 27-foot trailer with 3 rooms, lavatory, etc. Sleeps six. complete plan $1.00
STOCK No. H20 NATIONAL MODEL 20. A good-looking, easily-built 20-ft. trailer. 3 rooms, sleeps four. complete plan $1.00
STOCK No. H10 NATIONAL CAMPER. A compact unit for traveling, camping, hunting, fishing. Sleeps two. Complete plan .50
Special—Order all 3 of above plans.....$2.00

FREE! Big parts catalog with any order

NATIONAL TRAILER STORES
Dept. 9 Box 3353 Terminal Annex · Los Angeles 54, Calif.



HEATERS

Gasoline, burning 40,000 B.T.U. built by Stewart Warner for USAAF as cabin and engine heaters. Brand new and in original cases. Ideal for installation in trucks, buses, trailers, small buildings, etc. No exposed flame. Approx. shipping wt. 40 pounds. A bargain at..... $28.50 each while they last

Send check or money order to:

MICHEHL INDUSTRIES ATLANTIC BLDG. WASHINGTON, D. C.

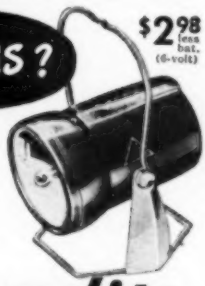
COMPLETE OUTFIT TO DRILL THROUGH CHINA, GLASS OR POTTERY

$1.00—Postpaid. Guaranteed.

Lang Lamp Company, Dept. PS, 1245 Bellevue Ave., Eau Claire, Wisconsin

EVER NEED THIS?

$2.98 less bat. (6-volt)

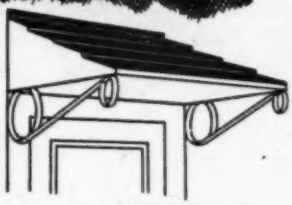


Maybe tonight's the night you'll need a good electric lantern. Here it is! Has dozens of uses, indoors and out. Shoots 800 foot beam. Light "stays put" at any angle you set. Buy at hdwe., sport, or electrical stores.

Delta REDDYlite
DELTA ELECTRIC CO., MARION, INDIANA

ALL-WEATHER PROTECTION FOR YOUR DOORWAYS

—ADDS BEAUTY AND VALUE TO YOUR HOME!

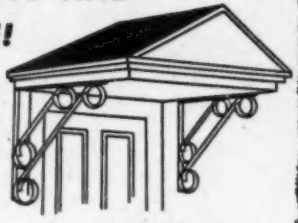


SLANT TYPE

48 inches wide, 32 inches deep, 9 inches tall. Furnished complete with 2 ornamental brackets ready to install.

ONLY $18.95 COMPLETE

Now, at low cost, you can dress up your home and protect doorways with a beautifully designed canopy. Simple to install by anyone in 20 minutes. All-aluminum construction — permanently rust and rot proof—attractively finished in white with green roof. You'll be delighted over the smart styling and extra value appearance these canopies will add to your home. Your satisfaction is guaranteed.



GABLE TYPE

48 inches wide, 32 inches deep, 17 inches tall. Furnished complete with 2 ornamental brackets, ready to install.

ONLY $29.50 COMPLETE

All-Aluminum DOORWAY CANOPIES

Write for descriptive folder and dealer in your locality

TEL-O-POST COMPANY • 140 Ash St., Akron 8, O.

AMAZING VALUE! NEW *"Hug-Tite"* *Complete*

AUTO SEAT COVERS

COLORFUL PLAID DESIGN
GENUINE FIBRE

FULL SET Front and Rear Seats Only **$6.98**

Style "H" Only **$3.49**
Front Seat Only **$3.98**

Order "HUG-TITE" Seat Covers From These Styles:

H SOLID BACK Rear Seat Sedan or Coach. Also Coupe
J SOLID BACK Front Seat Sedan

K DIVIDED BACK SOLID SEAT Front Seat Coach or Coupe

M INDIVIDUAL SEATS Includes both Front Seats

Think of it . . . COMPLETE Auto Seat Covers of real quality at sensational savings! No Sir, "HUG-TITE" Covers are not to be confused with partial covers. Compare these features! Genuine Fibre protects the entire riding surfaces of backs and cushions. Special "HUG-TITE" material covers ALL facings on front and rear seats; also ENTIRE back of front seat. Attractively trimmed with harmonizing leatherette. Colorful plaid fibre is glazed and lacquered; easy to clean, water-repellent, smooth, comfortable. Simple to install — no pins, no tacks. Just slip over upholstery. Snug fitting, smartly styled and durably constructed. Sold on 10-day MONEY-BACK GUARANTEE.

SEND NO MONEY—MAIL COUPON TODAY!

SANGERS, 325 N. Wells St., Chicago 10, Ill. **Dept. AC-1100**
Please rush "HUG-TITE" Auto Seat Covers.

.....FULL SETS: FRONT Style....; REAR Style....
at $6.98 per Set
.....FRONT SEATS ONLY: Style....at $3.98 Each.

.....STYLE "H" ONLY: at $3.49 Each.
(Indicate quantity and style H, J, K or M)

Car Make.....Body Style.....Year.....

☐ SEND C.O.D. plus shipping charges and C.O.D. Fee.

☐ SEND POSTPAID. I enclose full payment of $.....
(Illinois Residents, add 2% for State Tax)

NAME.....

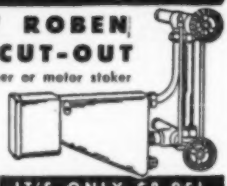
ADDRESS.....

CITY.....ZONE.....STATE.....

FOR SAFETY'S SAKE!

. . . THE NEW ROBEN LOW WATER CUT-OUT

for your coal furnace, oil burner or motor stoker



Here's a low cost, easy-to-install Low Water Cut-Out designed to automatically protect your heating system when water runs low. Feel confident the next time you leave your home —insure yourself now with a ROBEN LOW WATER CUT-OUT!

IT'S ONLY $8.95!

YOU CAN INSTALL IT YOURSELF!

SAVE OIL! SAVE MONEY!

REPLACE YOUR OLD OIL BURNER With This Brand New 1948 Model

ARISTOCRAT OIL BURNER

With oil so scarce this year, *now* is the time to replace your worn-out, fuel consuming oil burner! And there is no more inexpensive way to convert than by installing an ARISTOCRAT OIL BURNER *yourself*. This excellent burner comes complete with simple, easy-to-follow instructions and Minneapolis-Honeywell Controls including thermostat, relay and limit controls. Start saving today with this low-cost oil burner! ONLY **$97.50**

Send full amount—we pay postage or 25% deposit, Balance C.O.D.

ROBERT-BENJAMIN COMPANY
443 WASHINGTON ST., NEWARK, N. J.

Free! New CONCORD RADIO Catalog

The ONLY Complete Up-to-the-minute Catalog of RADIO PARTS • RADIO SETS KITS • HAM GEAR • TESTERS

The greatest, latest complete presentation of radio, electronic and television equipment and supplies in Concord history! Packed from cover to cover with thousands of items—160 pages of everything in Radio and Electronics. Special bargain section of hundreds of money-saving values. Scores of new items from famous makers. Parts, blueprints for famous Popular Mechanic and many other kits. Mail coupon below for your copy—sent FREE.

CONCORD RADIO CORP.

CHICAGO 7 — 901 W. Jackson Blvd.
ATLANTA 3 — 265 Peachtree Street
Downtown Chicago Branch: 229 W. Madison
LAFAYETTE RADIO CORPORATION

Concord Radio Corporation, Dept. PS-38
901 W. Jackson Blvd., Chicago 7, Ill.

Yes, rush FREE COPY of the comprehensive new Concord Radio Catalog.

Name.....
Address.....
City..... *State*.....

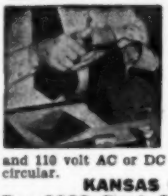
FOR BOATING PLEASURE AT ITS BEST

When you own a Wagemaker built "Wolverine" you're sure of superior workmanship, new post-war designs, exceptional performance, and maximum pleasure. De Luxe and Super De Luxe Molded Plywoods in 12'-14'-16' lengths, beautiful color combinations. Round Bottom Strip Boats, Car Top Canvas Boats, Dinghies, and many other models. Write today for free literature.

WAGEMAKER COMPANY
Dept. 26 Grand Rapids, Michigan

Sand Casting—Forging—Heat Treating—Case Hardening

BRONZE FOUNDRY



In your own workshop allows you to design and build your own GASOLINE ENGINES, STEAM ENGINES, STATUARY, ART OBJECTS, SPECIAL TOOLS, NEW INVENTIONS, ETC. You can also make forgings and case harden steel. Your shop is not complete without a FOUNDRYETTE. Three sizes are available capable of making bronze castings of 1½, 3 and 6 pounds weight, aluminum, copper, brass, etc., $22.50, $29.50, $42.00 f.o.b. Kansas City. Domestic gas supply and 110 volt AC or DC energy required for operation. Write for circular.

KANSAS CITY SPECIALTIES CO.
Box 6022, Dept. S-2 Kansas City, Mo.

AIR CORPS Type P23 Headphones

AT A FRACTION OF ORIGINAL COST
8000 ohm impedance, bipolar magnets. Extremely comfortable sponge rubber cushions, stainless steel leather covered headbands, concealed terminals. 6 ft. cord with PL55 plug. BRAND NEW. $15.00 Value.
No. 5A134 Spec. Per Pair..... **$2.95** Plus 25c each for Postage.
FREE Catalog on Everything in Radio and Electronics.
Burstein-Applebee Co. 1012 McGee, Kansas City 6, Mo.

DEVELOP RUGGED **STRENGTH!**

Strong Men's Club of America offers FREE Membership!

Send for your personal membership card and Strength Secrets. No dues! No obligations! Many valuable privileges! Send name, address, age, on penny postcard.

JOE DONOMO Strong Men's Club of America
Director (Dept. P.S.-38) 1841 Broadway, N. Y. 20, N. Y.

BIG PROFITS AT HOME!

Start own business assembling fast-selling playground gyms! Nationally known gym manufacturer furnishes special castings and fittings. You merely cut pipe and assemble. Investigate NOW! Write
L. A. STEELCRAFT PRODUCTS
1951 Lincoln Avenue Dept. P Pasadena 3, Calif.

PALMGREN Milling ATTACHMENT

MILL IT ON YOUR LATHE—Convert in 10 Seconds!

Mill, slot, grind, groove, square shafts, recess on lathe. Shops, schools, homes need this fixture. Saves time and money. Fits any lathe. Accurately graduated for rotary and vertical feed. No. 150 1½ inch $18.75, No. 250 2½ inch $24.75, No. 400 4 inch $39.75.

Write for No. 10 Circular
CHICAGO TOOL and ENGINEERING CO.
8396 South Chicago Ave., Chicago 17, Ill.

World's Most Complete Hand Tool!

New **VISE-GRIP** WRENCH

Now Even More Useful, More Powerful!

New Involute Jaw Curve fits anything, any shape. Provides increased tooth contact on all work. Knurled Jaw Tips hold to the very tip. Thin Nose reaches into tight places. Powerful Wire Cutter easily cuts wire and small bolts. Locks to work with Ton Grip. Easy to open. Adjusts to ratchet action. Fine alloy steel. Nickel plated. 2 sizes—7" and 10"—with or without cutter.

SEE YOUR DEALER! With cutter—7", $2.25; 10", $2.50. Without cutter—7", $1.85; 10", $2.25. Get yours now.

PETERSEN MFG. CO. Dept. E3 DeWitt, Nebr.

LAW STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction —over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW
Dept. 87-S, 646 N. Michigan Ave., Chicago, Ill.

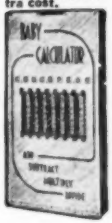
WORLD'S LOWEST PRICED ADDING MACHINE

VEST POCKET SIZE

IDEAL FOR BUSINESS OR PERSONAL USE

FREE TRIAL
ONLY **$2.95** TOTAL COST
SEND NO MONEY

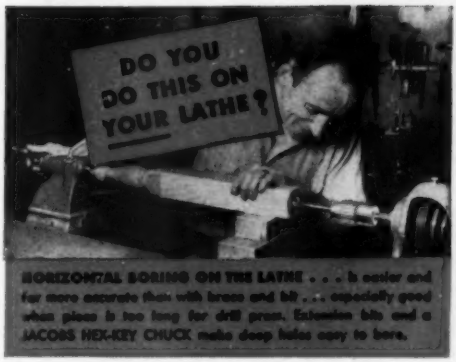
FREE!! Each Baby Calculator in Beautiful, rich-looking Leatherette case—at no extra cost.



Fits vest pocket or purse. Guaranteed accurate. Operated as easily, and as reliable, as machines costing many times as much. Not a toy. **Precision made, very durable—guaranteed for life against defects in construction.** You positively can't buy a calculator of equal quality for as little money. **ACCEPTED AS THE FINEST LOW PRICED CALCULATOR FOR OVER 35 YEARS!** Operates with a flick of your finger. Adds, subtracts, multiplies, divides—counts up to one billion. Pays for itself over and over in mistakes avoided, and time saved. **MAKES IDEAL GIFT.**

Sold on a positive money back guarantee. Send only $2.95. Calculator sent postpaid, or send name and address and pay postman $2.95 plus postage. **MONEY BACK IN 10 DAYS IF NOT DELIGHTED!** (If outside U. S., send $3.50.) **AGENTS WANTED.**

CALCULATOR MACHINE CO., (Mfrs.)
Dept. 488, P. O. Box 248, Glenview, Illinois



HORIZONTAL BORING ON THE LATHE . . . is easier and far more accurate than with brace and bit . . . especially good when piece is too long for drill press. Extension bits and a JACOBS HEX-KEY CHUCK make deep holes easy to bore.

Your lathe can be taught new tricks to multiply its usefulness when you use tight-gripping JACOBS CHUCKS.

Here is just one of many unusual operations you can perform on your home workshop equipment with the aid of JACOBS CHUCKS.

GET GREATER GRIPPING POWER . . . BETTER ACCURACY . . . LONGER LIFE WITH JACOBS' NEW RUBBER-FLEX COLLET CHUCKS

Exclusive, bonded rubber-and-steel construction . . . no loose jaws . . . no springs . . . not harmed by oils or coolants. Real precision chucks at popular prices. *See them at your local hardware dealer's.*

IF IT'S A JACOBS . . . IT HOLDS

HEX-KEY CHUCK . . . fits drill press spindles — motor shafts — jack shafts. With Morse taper arbor, fits lathe headstock, tailstock. 4 models, capacities to ½"; fits ½" or ⅜" shafts.

HAND-TITE CHUCK . . . fits all hand tools and power tools with threaded spindles . . . used on polishing heads, bench grinders, flexible shafts, etc. 3 sizes . . . capacities to ½". Models to fit ⅜-24, ½-20 and ½-24 threaded spindles.

ONLY *Jacobs Chucks* FOREMOST IN CHUCKS · FIRMEST IN GRIP

Have The Rubber-Flex Collet
Its Parallel Bite Holds True And Tight

The JACOBS MANUFACTURING COMPANY
200 Jacobs Road, Hartford 2, Conn.

Please send me your new illustrated folder on the Jacobs Rubber-Flex Hex-Key and Hand-Tite Chucks.

NAME.....

STREET.....

CITY.....ZONE....STATE.....

First

in Reliability

AC Spark Plugs are engineered to the equipment specifications of car and truck manufacturers—which explains why more than 50% of new cars and trucks leave the factory equipped with AC plugs. AC's give *you* wider Heat Range per plug—greater freedom from oil and oxide coatings—the utmost in spark plug reliability.

AC SPARK PLUGS

FIRST IN SERVICE, TOO

Your AC dealer will check your spark plugs to see that they are of the right Heat Range.

AC SPARK PLUG DIVISION • GENERAL MOTORS CORPORATION

MADE FOR EACH OTHER!

Yes, sir! A .22 caliber rifle and a Mossberg scope are "naturals" together. Scope aids the eye, brings the target up big and clear, easy to hit. And scope shooting is great fun! Mossberg Internal Adjustment Telescope Sights fit most makes of .22 caliber rifles.

Illustrated: Mossberg .22 caliber model #46B ($23.90 — West of Rockies $24.60) and Mossberg 4-power scope model 5M4 ($9.95).

SEE THEM AT YOUR DEALERS

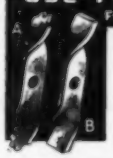
Send for FREE descriptive folder. No sales at factory.

O. F. Mossberg & SONS, Inc.

89703 St. John Street, New Haven 5, Conn.

USE YOUR BENCH SAW

FOR JOINTING & CUTTING MOULDINGS



With our six inch tool steel cutters make mouldings, casings, drop-leaf tables, grooves beading and jointing. Moulding cutters, A 1 in. wide $1.50, 1½ in. $2.00; Jointing cutters, B 1 in. $1.50, 1½ in. $2.00. E 1 in. for drop-leaf tables, $1.50. E 1½ in. Makes ¾ in. cove & Quarter. $2.00. Postpaid. Guaranteed. State size hole. List & Folder free.

JOHN A. SANDSTROM

Mt. 1-P. Clearwater, Fla.

LAW

STUDY AT HOME for PERSONAL SUCCESS and LARGER EARNINGS. 39 years expert instruction —over 108,000 students enrolled. LL.B. Degree awarded. All texts furnished. Easy payments. Send for FREE BOOK.

AMERICAN EXTENSION SCHOOL OF LAW

Dept. 87-S, 646 N. Michigan Ave., Chicago, Ill.

NOW YOU TOO CAN BUILD 15 RADIOS

COMPLETE KIT $14.75

Absolutely no Knowledge of Radio Necessary

You Need NO Additional Parts

The PROGRESSIVE RADIO KIT is THE ONLY COMPLETE KIT. Contains everything you need. Instruction Book, Metal Chassis, Tubes, Condensers, Resistors and all Radio parts.

The 36-Page Book written by Expert Radio Instructors teaches you to build radios in a Professional Manner. You start with a 1-tube receiver. Before you are done with this kit, you will have built 11 Receivers, 1 Public Address System and 3 Transmitters.

SPECIAL FREE OFFER!

Electrical and Radio Tester sent absolutely FREE with each Progressive Radio Kit. PLUS FREE membership in Progressive Radio Club. Entitles you to free expert advice and consultation service with licensed radio technicians.

Write for further information, or ORDER your KIT NOW! ONLY **$14.75**

Postage prepaid with check or money order.
(Postage not prepaid with C.O.D. orders)

PROGRESSIVE ELECTRONICS CO., Dept. 94

497 Union Avenue Brooklyn 11, N. Y.

Save on WAR SURPLUS

QUALITY AT BARGAIN PRICES

AAF FLYING HELMETS

New fleece-lined Muffs and chin straps. Just right for children, or for outdoor sports such as cycling, racing, etc. Now only

3 for $1.00

WALKIE TALKIE (Handie Talkie)

Never before used, in perfect condition. Complete with batteries. Tested for battle efficiency. Just

$39.50

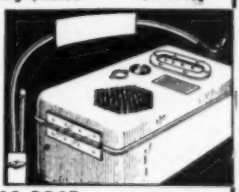
TELEPHONE SYSTEM—REMOTE CONTROL UNIT

Simple to install. No external power required. Several units can be used on one hookup. Not a toy but a real telephone which will work up to 50 miles. Complete with handset, excellent and tested.

NEW—Only $11.50

RADIO RECEIVER

New, six tube radio can easily be installed in any car, jeep, truck or even on farm tractor. Four-band adjustable selector buttons. Internal magnet type dynamic speaker. Can be used with headset. Complete with wet cell battery and extra set of tubes, etc.



ONLY $29.85

Type A3 BOAT

Five-man rubber boat. Comes with carrying case, bailing bucket, sea anchor, oars and adaptor which eliminates pumps.

$19.50

Send for FREE CATALOG

All prices F.O.B. Fresno, Calif. Send 25% deposit with C.O.D.'s

FORTUNE & SHAW

2250 McKinley — Dept. PS-3 — Fresno, Calif.

14,000 sanding strokes per min. with SAND-O-FLEX

—Compare this speed with hand sanding!

Quickly cleans and finishes intricate curves, contours on metals, wood, etc.

EACH SAND-O-FLEX sanding wheel contains 8 abrasive strips backed up by 8 separate brushes. When rotated at usual motor speed, you get *14,000 sanding strokes per minute!*

Not only does SAND-O-FLEX finish faster—it gets in and around complicated forms. Brushes mold to the work shape and rapidly sand, de-burr, finish. Produces beautiful satin finishes on metal. Abrasive strips unreel when worn. Replacement cartridges in many grits available at low cost.

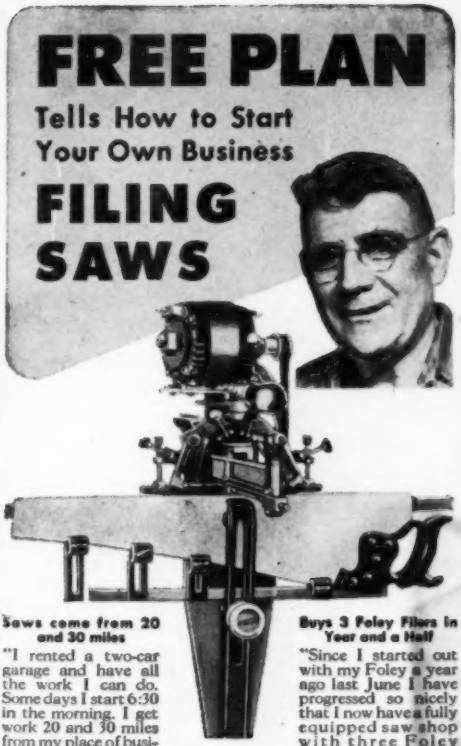
Use SAND-O-FLEX on your present tools—motor shaft, electric drill, flexible shaft, drill press, lathe, etc. SAND-O-FLEX has unlimited uses in home, farm and industrial workshops—5 sizes. See your dealer or write for free literature.

MERIT PRODUCTS, INC., 4373 Melrose Ave., Los Angeles 27, California

FREE PLAN

Tells How to Start Your Own Business

FILING SAWS



Saws come from 20 and 30 miles

"I rented a two-car garage and have all the work I can do. Some days I start 6:30 in the morning. I get work 20 and 30 miles from my place of business."—C.H.S., New York.

Buys 3 Foley Filers in Year and a Half

"Since I started out with my Foley a year ago last June I have progressed so nicely that I now have a fully equipped saw shop with three Foley Filers."—R. W. P., Wisc.

FOLEY FILED SAWS BRING NEW CUSTOMERS

Here is a steady repeat CASH business you can start in your own basement or garage in your spare time. Every saw you sharpen with the machine accuracy of the Foley Saw Filer is an ad that brings you more customers. S.M.H., Penn. wrote to us: "I am doing very well with my Foley Filer, and I am glad I invested in your machinery. It is very satisfactory and works very well in the small community in which I live."

You can file all hand saws, also band and cross-cut circular saws on the Foley Saw Filer. The adjustments are simple—there is no eyestrain—and you can start right away to turn out perfect cutting saws. "The first saw I sharpened with my Foley Filer came out 100%. I think it is a marvel of perfection."—writes C.E.P.

NO CANVASSING—Our Free Plan explains how you can get business from hardware stores, home owners, farmers, carpenters, schools, mills, factories, etc. Just think—with a modest investment, no overhead, no stock of goods to carry, you can start right in on a cash business that will help pay the rent, buy groceries, or a new car. Start now—you can get IMMEDIATE DELIVERY on a Foley Saw Filer.

Send for Free Plan on FOLEY SAW FILING BUSINESS

FOLEY MFG. CO., 319-8 Foley Bldg., Minneapolis 18, Minn.

Send Free Plan on Saw Filing business, no obligation.

Name.....

Address.....

Enjoy LOW COST LIVING OR TRAVEL!

..IN YOUR OWN SCHULT!

● Move into a 1948 Schult and you have an *equipped* home, ready for comfortable living or extended travel. Separate bedroom with luxurious bed . . . kitchen with built-in range, refrigerator and sink . . . generous wardrobe and storage space . . . all the most-wanted features, tastefully combined. No wonder that Schult, famous more than a decade for quality, is also today's outstanding VALUE. See the 1948 Schult models *now* . . . Write for name of nearest dealer. SCHULT CORPORATION, Department 3103, Elkhart, Indiana. *In Canada:* John Inglis Co., Ltd., Toronto.

Free
Write today for book on trailer coach living and easy-trailing new Schult 1948 models.

1948 Schult models have beautiful interiors. Above: Decorated living room of the Luxury Liner.

Member: Trailer Coach Manufacturers Assn.

SCHULT *Trailer Coaches*

Say You Saw It In Popular Science

Easy and Cheap to Operate

SAVE TIME, WORK, MONEY!

SHAW "DU-ALL" and "PEPPY PAL" TRACTORS

PLOW

CULTIVATE

MOW

RIDE

These rugged walking or riding tractors ideal for farm, truck garden, orchard, poultry farm. They operate on a few cents an hour. A child can handle them.

DO DOZENS OF JOBS

The Shaw Du-All or Peppy-Pal does many jobs quickly and easily. Plows, cultivates, harrows, disks, bulldozes, sprays, hauls, grinds, and saws wood.

BUILT FOR RUGGED WORK

Sturdy, extra-strength construction means low upkeep, long life. Full year's guarantee.

LOW FACTORY PRICES

Buy direct or through your dealer! Almost anyone who owns a garden can afford a Shaw Du-All or Peppy Pal. Mass production holds prices down —quality up.

RIDING TRACTORS

4 models, from 5 to 12½ H. P., 58 in. wheelbase, 36 in. wide, 24 in. plant clearance. Hand or electric starter. Improved steering device, brakes enclosed in differential housing shaft. Heavier frame and bearings. Standard hitch for trailers and wagons. Plow, harrow, cultivator, cutter bar, snow plow, bulldozer available.

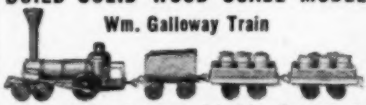
FREE—Illustrated folders giving complete details and price lists—write today!

SHAW MFG. CO.

5703 Frost St., Galesburg, Kan.
668 PS North 4th St., Columbus, O.

BUILD SOLID WOOD SCALE MODEL

Wm. Galloway Train



● Realistic StromBecKer model of first freight train in U. S. Length 14¾", height 3¾". Kit complete with ready-shaped parts for easy assembly, $1.00 . . . Other StromBecKer Kits: Piper Cub Supercruiser, 50¢; Submarine Nautilus, 35¢; Rock Island Rocket Streamliner, $1.50; many more.

Ideal for display on mantle, desk, or in collector's group.

AT YOUR TOY OR HOBBY DEALER

Send for free Catalog describing models.

StromBecKer

STROMBECK-BECKER MFG. CO., Dept. PS-3, Moline, Ill.

GIANT

Astronomical Telescope

100 diameters magnification. (10,000 area magnification) 3 inch diameter steel main tube 50 inches long. Brass focusing tube. Tripod 6 feet high. Equatorial mounting. Ready to set up and use. Full power and clear vision guaranteed. Price $15.00. 20% deposit on C.O.D. orders.

DEPT. BT, SUFFOLK SCIENCE SERVICE, MANORVILLE, N. Y.

"NO EXPORT ORDERS ACCEPTED"

TINYMITE

MIDGET RADIO!

FITS IN YOUR HAND! ONLY ¼ LB. Beautifully molded red cabinets! **No tubes—batteries or electric "plug-ins" needed!** Has scale dial—personal phone, **new type** fixed power crystal diode. **One Year Service Guarantee.**

GUARANTEED TO WORK on local stations if used as directed. **USE MOST ANYWHERE in bed, hotels, offices, farms, homes, etc.**

SEND ONLY $1.00 (bill, money order, check) and pay postman $2.99 plus C.O.D. fees on arrival or send **only** $3.99 for postpaid delivery! **Complete—Ready to play**—Excellent gifts for boys and girls. ORDER YOUR TINYMITE RADIO TODAY **AT THIS BARGAIN PRICE!** (Foreign $5.00 U. S. cash.)

PAKETTE RADIO COMPANY, INC. Dept. TPS-3 KEARNEY, NEBRASKA

Be "sittin' pretty"

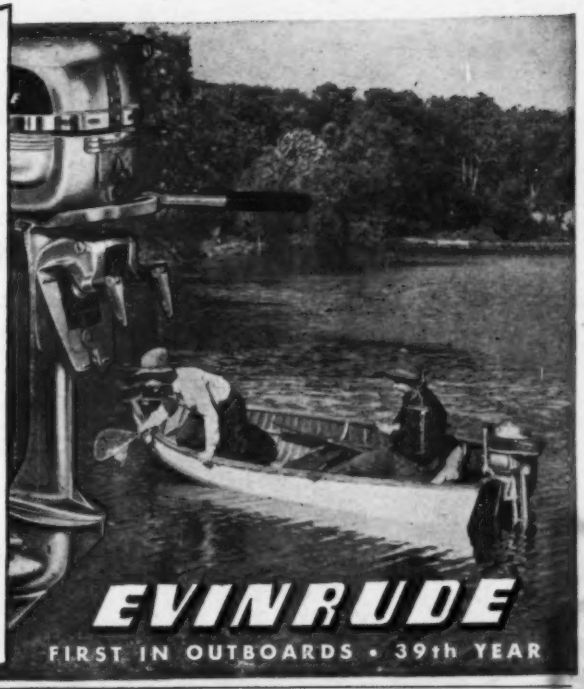
For more fun fishing in '48!

See your Evinrude dealer now!

Here are the facts. Not for years before the war were there Evinrudes enough to satisfy top-of-the-season demand. Now, the number of sportsmen who *want Evinrudes only* has multiplied many fold. So, if you want fishing features and performance only Evinrude offers, it's wise to see your dealer now!

There's a "fishing" Evinrude just right for you. The handy Sportsman and sparkling new Sportwin give you the revolutionary Weedless Drive . . . power where you please . . . through thickest weeds and over rocks, snags and reefs. For famed four-cylinder performance on larger craft choose the Zephyr or the Lightfour. Look for your dealer's name in your classified phone directory under "Outboard Motors." *Catalog* Free—address EVINRUDE MOTORS, 5708 N. 27th St., Milwaukee 9, Wis.

In Canada: Evinrude Motors Peterboro, Ontario



More Power, More Capacity, and More Versatility — than any other handgrinder!

Makes your work easier, faster, twice the fun!

Here's the handgrinder you've always wanted for your workshop — the tool that gives you more of everything you want, than any other handgrinder. Its full 1/14 HP motor has the extra power for "heavy" jobs. Its extra-capacity chuck takes all 3 tool sizes—1/4", 1/8", 3/32". With a simple, easy-to-use attachment, your Duplex becomes a flexible-shaft tool. Other attachments convert it instantly for bench or lathe work.

Think what you can do with the extra power, capacity, and versatility of the Dumore Duplex! Work in wood, metal, and plastics is faster, easier — and twice the fun!

The powerful Duplex is the perfect gift for any hobby-minded man or boy. See it in your local hardware store today —or send in the coupon below!

Tear out this coupon and mail today!

The Dumore Company, Dept. C-82, Racine, Wis.

☐ Please send complete information on Duplex Grinder.

☐ Send me DeLuxe Duplex Kit (27 accessories as illustrated); $27.50 enclosed.

☐ Send me Standard Duplex Kit (9 accessories); $19.75 enclosed. Shipping charges C.O.D. Attachments are extra.

Name.....

Address.....

City.....(.....) State.....

H-68

Get This

AMAZING MISENER Multi-cut HOLE SAW

Cuts finished
HOLES, WHEELS, DISKS, RINGS, GROOVES

One Tool Head Holds
11 SIZES OF BLADES
1, 1¼, 1½, 1¾, 2, 2¼, 2½, 2¾, 3, 3¼, 3½ dia.
(¾" Blade Depth)
Replacement blades at LOW COST

Perfectly cuts WOOD, METALS, PLASTICS
and many other materials
—with electric drill or bit brace
—on drill presses and lathes

ONLY
$17.50

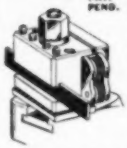
Includes Tool Head and 11 sizes of blades
Specify whether for power or hand use

Send for Folder
"THE HOLE STORY"

MISENER
Mfg. Co., Inc.
Walton St.
SYRACUSE 2, N. Y.

SOUTH BEND

Universal Tool Block



Replaces tool post and nine standard tool holders. Rigidly supports turning, boring, threading, and cut-off tool bits. Rotatable. Has self-aligning knurling head. Precision adjustment for tool height. No re-adjustment required when replacing tools. Adaptable to some other lathes Write for dimension sheet.

Lathe Size	9"	10"	13"	14½"	16" 16/24"
Price	$11.25	11.75	13.75	15.75	16.25

SOUTH BEND LATHE WORKS 456A E. Madison St. South Bend 22, Ind.

TOOL STEEL
DRILL ROD

$1.95 POSTPAID in Continental U.S.
C.O.D.'S ACCEPTED

25 Rods — SAMPLE KIT — 25 Sizes
Ground and Polished to a Perfect Finish
1001 uses for CRAFTSMEN, HOBBYISTS, MECHANICS, Etc.

For Making
Punches, Chisels
Engraving Tools
Shafts, Etc.

Free machining, easily worked, yet can be made file hard or hardened to spring temper. Hardening instructions included!

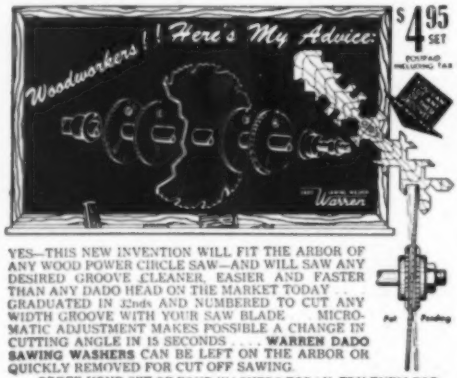
FREE
With Every Kit or first order 6" Steel comb. rule & depth gage with pocket clip and latest price list.

FLAT TOOL STEEL
The Precision ground flat tool steel with the satin-smooth finish. Simple to work, easy to harden, ready to use
SHOP ASSORTMENT $4.80
(5 dif. Pieces—1/32" to ⅛" thick; ⅛" wide, 18" long.)

BOTH KITS $6.50
Complete aluminum—brass—stainless & tool steel stocks
Include 25c postage on orders under $5.00.

BESSEMER STEEL COMPANY OF AMERICA, DEPT. CC-15
1958 W. 59th St. Chicago 36, Illinois

YOUR CIRCLE SAW BLADE CAN CUT GROOVES LIKE THIS
Easily — Quickly — Accurately



$4.95 SET
POSTPAID INCLUDING TAX

YES—THIS NEW INVENTION WILL FIT THE ARBOR OF ANY WOOD POWER CIRCLE SAW—AND WILL SAW ANY DESIRED GROOVE CLEANER, EASIER AND FASTER THAN ANY DADO HEAD ON THE MARKET TODAY . . . GRADUATED IN 32nds AND NUMBERED TO CUT ANY WIDTH GROOVE WITH YOUR SAW BLADE . . . MICROMATIC ADJUSTMENT MAKES POSSIBLE A CHANGE IN CUTTING ANGLE IN 15 SECONDS . . . **WARREN DADO SAWING WASHERS** CAN BE LEFT ON THE ARBOR OR QUICKLY REMOVED FOR CUT OFF SAWING.

ORDER YOUR SET OF FOUR WASHERS TODAY, TRY THEM FOR TEN DAYS. IF NOT SATISFIED, YOUR MONEY WILL BE REFUNDED

Arbor ☐ ½ ☐ ¾
Sizes ☐ ⅝
☐ Check
☐ Money Order
☐ Free Booklet

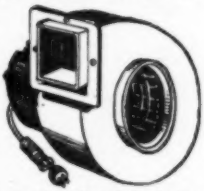
Gentlemen:— Please send _____ sets of sawing washers
Name _____
Address _____
City _____ State _____
ALL SETS SHIPPED POSTPAID

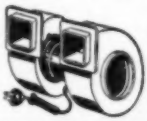
WARREN DADO SAWING WASHERS CO.
P. O. BOX 98 NORTH END STATION
DETROIT, MICHIGAN

CAST ALUMINUM EXHAUST BLOWERS

NOW! ONLY $10.00

FOR WORK SHOPS, DARKROOMS, CELLARS, ATTICS, LAUNDRIES, ETC. 110V A.C. 50-60 CYCLE. Cord attached ready to plug in. Delivers approximately 100 cubic feet per minute. Satisfaction guaranteed.





DOUBLE EXHAUST
$15.85

Send check, money order. West of Mississippi add $1.00 for mailing, handling. **IMMEDIATE DELIVERY.** Service men and dealers: Inquire about quantity discounts.

UNIVERSAL YONKERS CORP. (Dept. S-3) 137 Alexander St. YONKERS 2, N. Y.

Make Your Car or Truck
A PORTABLE POWER PLANT
This Easy, Economical Way!

ASPEN DRIVE-ALL gives power when you want it . . . where you want it! Just line up with rear wheel, drive on to unit, and you're set for work! No jacking up or demounting! Use the rugged DRIVE-ALL for all belt-driven operations requiring up to ten h.p.!

LOW-COST ACCESSORIES—
Generator; Grinder Centrifugal Pump.

Aspen DRIVE-ALL

FREE! Write today for illustrated folder and full information to: Aspegren Mfg. Co., Inc., 1612-H Webster Avenue, Bronx 57, N. Y.

MOTO-TOOL

ELECTRIC DREMEL POWER TOOLS

THE "POCKET-SIZE" MACHINE SHOP

A SHOP-TESTED TOOL

Moto-Tool is backed by over 10 years of industrial use . . . packs extra years of pleasure . . . yet, due to increased production, pre-war prices still prevail!

About 27,000 R.P.M.
Cuts Cleaner . . .
Saves Cutters

LOOK FOR THESE MOTO-TOOL FEATURES

Approximately 27,000 R.P.M. plus dynamically balanced armature provides vibrationless finger-tip control. Moto-Tool has oil-less, sealed bearings • Patented automatic chuck lock pin • Over-size armature shaft, hardened, ground, polished • 110 Volt, AC-DC motor • Sliding snap-type switch • Cord protector • Shock-proof bakelite housing • Dust-filtered air-cooling system • Weighs only 13 oz.

HERE'S BIG VALUE
Model No. 1 Moto-Tool Kit
Only $17.50

This popular Kit contains the smaller, lighter (Model 1) Moto-Tool and 34 accessories in attractive, lacquer-finish wood box. It's the biggest bargain in the field.

↑ MOTO-TOOL KIT NO. 2
With 23 Accessories
(High speed steel Cutters, Grinding Wheels, Polishing Accessories)
Only $23.50

New DREMEL DRILL PRESS
Only $9.95
(Less Moto-Tool)

Here's a light, portable precision drill press at an amazingly low price. Just the thing for creating costume jewelry, model making, wood carving, routing, etc. Utilizes Model No. 2 Moto-Tool, which can be raised or lowered, swung in any direction or quickly removed in a few seconds for off-hand use. Drill Press stands 12" high. Base is 6¾" x 4". Weighs approximately 3½ pounds.

MONEY-BACK GUARANTEE: Buy Dremel Moto-Tool from your dealer. If he cannot supply you, order direct from factory on 10 day trial, money-back guarantee. Ship postpaid for payment in full (send check or money order); or send only $2.00, we will ship C.O.D. You pay postman balance plus postage.

DREMEL MANUFACTURING COMPANY
Dept. 128-C • Racine, Wis.

FREE Sample Of New PLASTIC Shows How To Make Leather and Leatherette LIKE NEW!

MAGICALLY CHANGES CLOTH TO IMITATION LEATHER

SAVE MONEY - TIME AND EFFORT by renewing Luggage—Leather Covered Furniture—Golf Bags—Auto Seat Covers—Restaurant Furniture, Booths or any Leather or Leatherette item with new plastic discovery called Leather-New. Coat cloth or cloth covered items such as Glider Cushions, Tarpaulins, Porch Furniture, Etc. and make them look and wear like they were leather. Spreads easily with brush or spray gun—leaves NO BRUSH MARKS. Simple Acids, Caustics and Alcohols do not stain this finish—It is sun and mildew proof. Stays Fresh and Clean as long as real leather. Comes in all standard colors. Just mail coupon for Free sample of Leather-New coated material which shows effects.

OWN A PROFITABLE LIFETIME BUSINESS

Cash in on big profits to be made in this new business—Profits up to $700.00 monthly possible, renewing booths and furniture for bars, restaurants, grills, movie houses, etc. Mail name and address on 1c postcard—I'll show you how. Jack Edwards, Sales Mgr.

JUST MAIL COUPON
No Obligation

Leather-New Products, Leather-New Bldg., 4723 Troost, Dept. S-3, Kansas City, Mo.

Name.....
Address.....
City..... State.....
Fill Out—Mail Today

LEATHER-NEW PRODUCTS, Leather-New Bldg., 4723 Troost, Dept. S-3, Kansas City, Mo.

MAKE REAL MONEY! ASSEMBLE AND SELL THESE FANS IN YOUR OWN HOME TOWN

Fun and Profit for You! Record Season Ahead for Fans

Supplies and help shortages mean fans will be in great demand again this year. Pleasant hours spent now will turn into cold cash with warm weather. Complete kit includes powerful 110V—60 cycle electric motor (completely assembled) made to meet U.L. requirements. Everything as pictured with all necessary screws, nuts, no additional parts needed. Complete instructions for assembly and testing—so easy youngster can put together in 30 minutes. Fan stands 11½" high, has 8" blade. Get order in now for early delivery. Supplies limited. Positive money back guarantee with every fan kit.

R. DONALDSON COMPANY
369 S. Maple Street • Akron 3, Ohio

COMPLETE KIT
ONLY $3.95
In lots of 6
In lots of 3.....$4.29
In lots of 1.....$4.95
Regularly Retails $7.95

SENT POSTAGE PAID. SEND CHECK OR MONEY ORDER. NO C.O.D.'S. Ohio Orders Add 3% for Sales Tax.

Announcing SHAPER and MOLDING *Cutters* FOR ALL MAKES OF DRILL PRESSES!

NO SET SCREWS TO LOOSEN! BLADES AUTOMATICALLY ADJUSTED. CANNOT SLIP OR FLY OUT!

OTHER EXCLUSIVE FEATURES

Blades instantly replaceable—automatically drop into position—cannot loosen or fly out . . . quickly rehoned or reground. Variety of blade shapes for varied contours. Balanced, concentric, built for lifetime use. One locking nut only. Fits tapered, threaded, or ½" I.D. spindles. Specify type and size spindle.

$9.00

Complete as illustrated with 3 sets of blades. Full Money-Back Guarantee

$7.95

ALL-METAL SHAPER FENCE

For use with shaper and molding cutters, planers and drum sanders. Fits all drill presses and shapers. Complete—with tempered hold down springs. Fully rust proofed. A real buy.

2½" DRUM SANDER

$3.95 with 5 Sleeves

ROTARY WOOD PLANER

Most sensational, versatile drill press tool ever built. Planes, trues-up, tenons, panels, rabbets, grooves, beads, bevels, etc. An all purpose, lifetime tool. Complete: **$7.50**

4" ROTARY SANDER

Sands wood and plastic surfaces to agate smoothness. Available for hand drills, flexible shafts and drill presses. Two size arbors ¼" or ½". Complete with 20 discs. **$5.95**

FULL 10 DAY MONEY-BACK GUARANTEE

FREE Workshop Catalog →

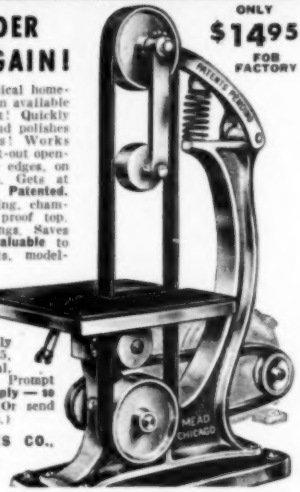
BARRON TOOL COMPANY, INC,
270 Architects Bldg.: Detroit 1, Mich.

BARRON PRECISION WORK SHOP TOOLS

THE MACHINE THAT AMAZED THE EXPERTS!

BANDSANDER IS BACK AGAIN!

ONLY **$14.95** FOR FACTORY



The remarkable, economical home-shop Bandsander is again available for immediate shipment! Quickly shapes, sands, carves and polishes wood, metal, plastics! Works equally well on **inside** cut-out opening or irregular outside edges, on intricate scrolls, curves. Gets at places no other can! **Patented.** Tilting table for bevelling, chamfering. Rust-and-sweat proof top. Self-oiling sleeve bearings. Saves time, labor, money. **Invaluable** to homecraftsmen, hobbyists, model-makers, etc. Normal band speed 1600 ft. per min. gives fast, smooth, clean cuts. ⅙ hp 1725 rpm motor recommended. **Rush** only $14.95 with order—or $5, balance COD. 5 Days Trial, Money Back Guarantee. Prompt shipment. **Limited supply — so hurry!** Dealers write! (Or send postcard for Free details.)

MEAD SPECIALTIES CO.,
4114 N. Knox Ave., Dept. 238, Chicago 41, Illinois.

PLYWOOD BOAT KITS

$49.00 (Including Freight)

This READY-CUT 12 ft. fishing boat can be assembled in 8 hrs. without forms or special tools. Kits are complete including all hardware, paint, and etc. Send for free folder.

TAFT MARINE WOODCRAFT
Dept. K 636 39th Ave. N.E. Minneapolis 18, Minn.

Now a DYNAMIC Industrial Transformer Type Super Charged WELDER

FOR AUTO, HOME APPLIANCE AND FARM REPAIRS

DESIGNED TO DO HIGH GRADE WELDING *inexpensively*—Maintenance Men, Farmers, Mechanics, Machine Shops, Foundries, Auto, General Repair and Job Welding Shops, all using the DYNAMIC find it so indispensable and useful that they can't afford to be without it. **EASY-TO-OPERATE.** If inexperienced you can easily learn to do a variety of high grade welding jobs by following the practical, *simplified Welding and Operating instructions furnished.* Once you see the DYNAMIC in operation you won't want to be without it. Its simplicity will amaze you. In a year the DYNAMIC only costs you about 7c a day. Comes complete ready to operate with helmet, rods, cable, holder, operating and welding instructions, etc.

FOR ONLY $28.50 COMPLETE

DO YOUR OWN WELDING

Just a few repair jobs will pay for this machine. A practical and profitable machine tool for any workshop. Make money doing repair work for others.

Write for Particulars

Get Details on our 10 day Trial Offer

Member Chicago Association of Commerce.

Saves You Valuable Time and Money!

This portable, industrial transformer type *Dynamic Welder* easily carried right to the job can be operated from any convenient properly wired 110 Volt 60 Cycle Line. **WORKS on IRON, STEEL, BRASS, BRONZE and Other Metals.** Has 8 metallic and carbon are heat stages. Does work you would think only possible with a larger more expensive machine ... Can also be supplied for 220 VOLT 60 CYCLE operation and other voltages and cycles at slight additional cost.

DYNAMIC WELDER CO., 15 East 23rd Street, AE, CHICAGO 16, ILL.

NEW BIG POWER SAW

by AMERICAN

Here's the new American Portable Electric Saw—ideal to save time, labor and money in *production work.* Not a hobby tool. Speedy . . . powerful . . . easy for one hand operation. 8" blade. Adjustable. Precision-built, dependable. Write for free details, giving your occupation. The American Floor Surfacing Machine Co., 532 So. St. Clair St., Toledo 3, Ohio.

5 POWER TOOLS IN 1

$34.95

COMPLETE HOME WORKSHOP

Here is power tool pleasure and profit in a ruggedly built, HEAVY steel unit—the Emrick Universal Woodworker. Handles big work. Drill press pulls ½" drill in steel. Saw takes 6" to 8" blade. Lathe 10" swing, 30" centers, spindle dia. ¾". Takes all standard accessories. Sander 8" dia. Emery wheel 5". Bronze bearings, replaceable throughout. Price does not include motor and saw blade. Order today.

10 DAY TRIAL

1753 CLINTON STREET
EMRICK, Inc. KALAMAZOO 24, MICH.

☐ Ship on 10 Days Trial. I am enclosing $17.50, balance C.O.D. ☐ Send free literature.

Name_____

Address_____ City_____

SOLVE Your Transportation Problems . . .

with the new

MARMAN ★ TWIN

THE ONLY BIKE MOTOR WITH EXTRA TWIN CYLINDER POWER

Ride to work, school, shopping, anywhere—easily, inexpensively. No parking problems, no prohibitive maintenance costs. Saves your car... faster and cheaper than a bus or streetcar... loads of fun for everyone.

SUPERIOR DESIGN AND PERFORMANCE

With the Marman Twin you'll have faster getaway, easy hill climbing, effortless cruising speed of 35 MPH, because the Marman Twin has 3¼ H.P. . . more than 25% greater than any other bike motor.

You'll get over 100 miles per gallon . . . greater efficiency and horsepower per pound and per dollar from the 2-cycle, horizontally opposed engine.

Smoother, faster acceleration . . . easy idling at stops . . . no pedalling because of the automotive type, multiple plate dry disc clutch.

LOW MAINTENANCE COST With only 5 moving parts in the motor, upkeep is kept to a minimum. No valves or tappets to wear or renew. The clutch replaces the traditional belt slipping arrangement and saves wear and tear.

TOP STYLING Chrome plated gas tank, tool compartment, muffler and pipes, to harmonize with any color bike. Makes a bike look like an expensive motorcycle.

Easily installed on any man's balloon tire bike. Money back guarantee.

Factory price $129.50 plus tax

IF NO LOCAL DEALER... USE THIS COUPON

MARMAN PRODUCTS CO. INC.

P. O. Box 89, Inglewood, Calif., Dept.PS-3

MARMAN PRODUCTS COMPANY, INC.
P. O. Box 89, Inglewood, California ★ Dept. PS-3

☐ Send me one Marman Twin Motor with complete installation instructions. I enclose $136.97 ( ) check or ( ) money order which includes $6.48 Federal Excise tax.

☐ Send me further information and descriptive literature only.

Name_____

Address_____

City_____ State_____

Dealers write for information.
Many desirable territories open.

Make BIG PROFITS

OPERATING YOUR OWN

CEMENT BLOCK MANUFACTURING PLANT

Easy to Get Started

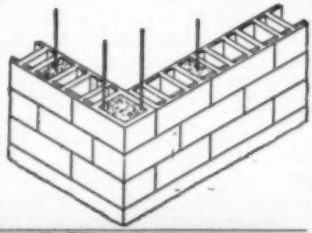
BIG EARNINGS await those aggressive enough to take advantage of today's building boom and get into business for themselves operating a modern efficient cement block making plant. Our patented Interlocking Mortarless block is the answer to the high cost of building. These blocks are easy to lay being self-aligning—no mortar used.

Meets Standard Building Requirements

Building experts have predicted at least a 10-year building boom to provide housing and needed commercial buildings. Large market in garden walls, patios, barbecues, extra rooms, etc. Our machines unexcelled for speed and economy in making blocks. Profits in this market are limited only by your efforts.

Exclusive Territories Open

Exclusive territorial franchise is granted to each Mortarless Concrete Block plant insuring big earnings and protecting your investment. Complete information supplied for plant operation. Get in on the big Spring and Summer building activity just ahead. Complete details supplied on what it will cost you to get started as OWNER and OPERATOR of a MORTARLESS CEMENT BLOCK PLANT. Act NOW! No obligation.



GET THE FACTS TODAY

Write to

MORTARLESS TILE MACHINE CO., INC.

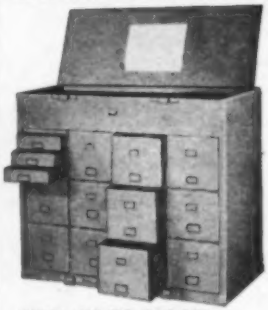
Dept. PS
2623 Riverside Drive
Los Angeles 26, Calif.

FOR HOME WORKSHOPS — FOR GARAGES

STEEL *Tool and Spare Parts* CABINETS...

GOVERNMENT SURPLUS — 16 ga. ALL STEEL CONSTRUCTION

(BRAND NEW)



- 4 ft. wide, 24" deep and 40" high.
- 11 large drawers, —10½" wide, 9½" high, 22½" long.
- 3 small drawers, —10" wide, 2¾" high, 20" long.
- Drawers may be partitioned into 1" compartments.
- Entire cabinet secures with one lock.
- Masonite board riveted on top cover for use as a work bench.
- Shipping weight—400 lbs.

SEND CHECK TODAY!
SUPPLY LIMITED!

Cash with order or ⅓ down—balance C.O.D.

Only $55.00

IMMEDIATE SHIPMENT — **FOB Cleveland**

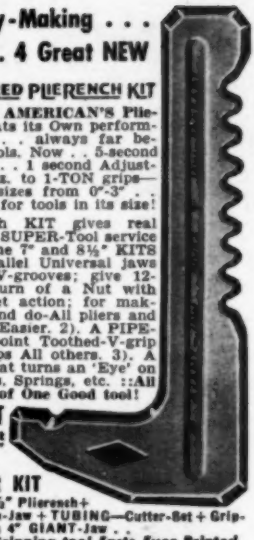
WEBER MACHINERY CO.

1801 E. 21st St. — Cleveland, O.

For . . . BIG Money-Making . . . Doing ALL Work . . . 4 Great NEW

7"

8½"



FIFEL-GEARED PLIERENCH KIT

- **AGAIN . . AMERICAN'S Plierench** Kit Beats its Own performance Record . . always far beyond other tools. Now . . 5-second Jaw-Changes . . 1 second Adjustments . . 1-Oz. to 1-TON grips—in a Million sizes from 0"-3" . . as against 1" for tools in its size!
- A Plierench KIT gives real ALL-Purpose SUPER-Tool service . . Each of the 7" and 8½" KITS has: 1). Parallel Universal jaws with 4-way V-grooves; give 12-grips to a Turn of a Nut with Lock-&-ratchet action; for making Springs and do-All pliers and wrench work Easier. 2). A PIPE-Jaw with 4-point Toothed-V-grip that OUT-grips All others. 3). A WIRE-Jaw that turns an 'Eye' on ¼" Rod, Coils, Springs, etc. ::All for the Price of One Good tool!

The GIANT KIT is the 8½" Kit plus this 4" GIANT-Jaw.

THE MASTER KIT Comprises the 8½" Plierench + PIPE-Jaw + Wire-Jaw + TUBING—Cutter-Set + Grip-CLAMP and this 4" GIANT-Jaw . .

GET the Most Amazing Gripping-tool Facts Ever Printed

MAIL this Part of Ad TODAY on a Postcard will do . . Print Your address . .

Get **FREE**—the 115-Picture MANUAL-M and the 120-Picture CATALOG-C . . With BIG-Money-Making Offer for—Full-time DISTRIBUTOR ☐ . . Part-time AGENT ☐ Or . . User Offer ☐

AMERICAN PLIERENCH CORP'N
4611 N. RAVENSWOOD AVENUE
DEPT. PS-83, CHICAGO 40, ILLINOIS

NEW — FREE

Bottle-Cap Opener, etc.

- Also **FREE**, this 3", 6-Edge, End-and-Angle, MULTITOOL — for Large and Small Screws in All positions and for countless useful jobs.

IMPROVED TELEVISION only $26.95

Amazing new electronic development greatly improves television picture. Makes excellent reception possible in "fringe" areas—or with indoor aerials in cities. Completely self-contained. Simply insert in aerial lead-in. $26.95

$5.00 deposit; balance C.O.D.

RADIONIC-TELEBOOSTER, 1787 Nassau St., N. Y. C. 7, N. Y.

Test-O-Lite *the MODERN TROUBLE SHOOTER*

THE NEON GLOW

. . . LOCATES TROUBLE INSTANTLY in electric circuits, fuses, cut-outs, motors, radios, appliances. Tests everything electrical from 100 to 550 volts. Indicates hot or grounded wires. Tells AC from DC. Engineers prefer it because it has patented safety features.

PUTS "FINGER" ON THE TROUBLE SPOT - - QUICKLY

For superior to ordinary clumsy test bulb. Saves precious time. Indispensable in shop or home. Vest pocket size. Lifetime guarantee. (Pat. No. 1,778,883) Purchase through regular electrical dealers, now only 95c.

L. S. BRACH MFG. CORP.
200 Central Ave. — Newark, N. J.

SAVE UP TO 85% in WAR SURPLUS...SENSATIONAL VALUES at "GADGETEER'S HEAVEN"

IN MANY ITEMS WE HAVE THE WORLD'S LARGEST SUPPLY

NEW HYDRAULIC Cylinders, Valves, Pumps,

FITTINGS, HOSE & TANKS
51 sizes & types.
The World's Largest Supply
1001 Labor Saving Adaptations for pulling, pushing, lifting operations.
Finest precision workmanship and materials. Liquid and or air operation, developing terrific power.
20,000 Available
PRICED TO SELL AT 15% GOVERNMENT COST!
WRITE FOR CATALOGUE.

WINCH HOIST

50 ft. 1/4" Alloyed Steel Cable with Hook. Reinforced Frame 12" x 12". Rubbed bearing Housings. 1" O.D. Alloyed steel tubular frame for portable attachment. Cable guide roller pulley for low sweep design.
new equipped with mounting frame, handle, cable, etc. complete.
Thousands of Satisfied Users! Hundreds have written, telling us it's the most wonderful tool in the world!
Capacity 2500 lbs. 20-1 ratio
Bronze Worm Gear
Ideal for Garages, Truck loading, Machine Shops, Boat Builders, etc. $14.59
A few extra one racks available to old customers at $2.45 ea. #2C

Pneumatic RIVET GUNS

#180 Pistol & Gooseneck Type. Use for Chipping, Riveting, Tamping, Scaling, Breaking concrete and metal body work.
#181 Pistol
Chicago Pneumatic, Cleco, Ingersoll Rand E3, E2, 3X, 2X, OY
$35 Value
$8.95
#186 Squeezer — PNEUMATIC ALLIGATOR SQUEEZER $80 Value #186 $15.95

PUMPS

HYDRAULIC, VACUUM, AIR
For every purpose at 15% of Value.

P-1 Hydraulic Pesco Type Positive displacement gear type. Capacity: 1 gal. per min. at 1500 R. P. M. at 1500 P. S. I. Operating speed: 3750 R. P. M. Intermittent maximum 4500 R. P. M. Rotation: either direction with slight adjustments. $9.49

P-4 VICKERS Positive displacement axial piston type. Capacity: 8 gal. per min. at 3000 R. P. M. at 1500 P. S. I. Operating Speed: 3750 R. P. M. Intermittent maximum 4500 R. P. M. Rotation to right only. $14.49

PV-1 May be used as air or fuel pumps for pressure or vacuum. Will pump 7½ gals. oil at 300 R. P. M. Builds air pressure 30 lbs. per sq. in. at 1000 R.P.M. Vacuum draws 28 in of mercury at 1750 R. P. M. $9.49

Here's a Real "Lite Special"

Farm, Auto, New U. S. Navy Portable Pistol Grip. Sealed Beam. 12v. 24v. Search Spot, or Emergency. Light-featherweight Gov. $35.00 our price $2.95
3 Extra filters - Red, Green & Amber 93c Set
Extra Seal Beam 95c ea.

AIRFORCE GUNSIGHT #102 $1.95
#102 contains triple Lens. #103A NEA non-glare variable density Lens plus other Lens. Valuable for Photo work $2.55
Lens in these sights are worth many times the entire cost of these items.

Electric GYRO PILOT

Assembly Part 2 solenoids for reverse and forward motor control. 2 solenoids throw clutch to engage drive. With brake assembly. Can be used as boat rudder control, converted for lathe tapping and slow speed motor tool. Wt. 29 lbs. Finest precision workmanship.
Cost Gov't. Thousands!
Your Cost $8.95 #513

AIR DRILLS

INGERSOL-RAND, CHICAGO PNEUMATIC ¼" JCB Chuck
Pistol or Straight #190 $12.95
Angle Drill $15.00

NEW FLEXIBLE GOOSENECK LAMP

110 V. A. C. 13 ft. wire with socket, switch and plug. In mounting bracket suitable for home or workshop.
Wire alone worth our price of .99c each

NEW PULMASON DUST RESPIRATORS

Ideal for use where foreign materials foul air. Paint Spraying, Grinding, Dusting, Sanding etc. ea. 99c

NEW AMPLIDYNE MOTOR-GENERATOR

#511
With 24 volt current, it gives 80 volt output. This unit has been adapted to independent and rural lighting power.
Welding and many other uses. Weight 29 lbs.
Gov't. Cost Approximately $237.00!
A Steal at $8.95

BATTERIES

#516 #515
NEW! FULL STRENGTH FOR PORTABLE RADIOS, SIGNAL LAMPS, BOATS, ELECTRIC TRAINS, ETC.
#516 9 Volt 8½ x 6 x 4 in. ..... 3 run 24 or 27 Volt motor 79c
These batteries are especially suited to portable radios.
#517 67½ & 1½ Volt Battery 69c
#515 90 & 1½ Volt 69c

NEW PRESSURE TANKS

Stainless steel - Shatter proof. Rustless. 10,000 available in 4 different sizes. 1001 uses.
G-1 12½ x 24 inches - 7100 Cu. In. capacity 30 cu. ft. $4.75
D-2 8½ x 24 in. - 500 Cu. In. capacity - 7 cu. ft. $2.49
F-1 -18" x 18" 1000 Cu. In. Capacity $3.95
F-2 8 x 45 in. - 1000 Cu. In. capacity 14 cu. ft. $3.95
Perfect portable air tank to carry in car or trailer. Ideal for painting cooking, spraying, ocean boats.

DC GENERATOR 140 AMP

#G-1
Direct Current Generator, especially suited for adaptation to homemade welding unit.
A fast moving item at $15.95

ELECTRIC SOLDERING IRON

#198
110 Volt A. C. "SOLDER MASTER"
$8.50 Value $2.95 200 Watts

New Electric Motors

1/6 H. P., 24 volt. D. C. motor, series wound Wound New $3.95
#501 1/6 h. p. 24 V Series
#502 H. P. 24 V D. C. motor used $8.95

VALUABLE GEARS BARGAINS!

#G-11
8 to 1 ratio, spindle drive #110 $2.98
6 to 1 with screw shaft #111 $4.95
85 to 1 (can be used for radio, antennae, etc.) #112 $3.95
2 to 1 ratio 90° right angle #113 $3.95
10 tooth bevel steel boxed gear $4.95
113a 6 to 1 ratio 90° right angle $4.95

Flexible Gear Shafts With End Drives
115 ..... 50" 69c ea.
115a ..... 60" 99c ea.
Radio tuning shafts that can be used as flex gear drives #115a 12 ft. ½" nut --15 tooth internal spline $1.95 ea.
#115b 25 ft. ⅜" nut 12 tooth with internal spline $3.95

FIRE EXTINGUISHER

#601
Kiddie Lux CO2 Type
Built to Gov't. spec. 3½ lb. size, can with hose & bracket. Gift package. FIT TYPE
$30.00 value #601A $11.75
5 LB. CO2 TYPE
$22.50 value #601 $8.75
10 lb. Chpd. CO2 with hose. $60.00 value #601 $24.50
15 lb. Chpd. CO2 with hose. $80.00 Value #605 $27.50
Indispensable for small or large planes, trucks, auto, home, factories.
NEVER AGAIN NOT LIKE THIS!

PEXTO SIDE CUTTING PLIERS

#121
Serrated head, long jaws. Has file cuts wire, solid pin, alloyed steel. Ideal for home, electrical, or shop use. A $3.50 value for $1.95

CLAMPS

#120 #121
Adel Aluminum, rubber lined. Mixed. #121 4 dozen 89c
#120 Aero-Seal. Rust Resistant. Slotted with screw gear top, ½" to 3".
Regular 27c now 10c

Tank Telescope For Fun & Utility

3 Power 3½ lb. wrinkled shagreened hvy. cone. 28" x 4".
#201 T M-5A1 $4.95 ea.

All Purpose HAMMER

PENTCO #107
As a hammer combination for wood & metal work. 3½ lbs. 14½" hardwood handle. hard steel cutting edge. Compound 69c

PERISCOPE M3

#101 P
2 Power with small 3" telescope inside $3.95 ea. Lenses in both Scopes worth more

AIRCRAFT CABLE

Alloyed steel, rust resistant, 3/16" dia 21 ft. long, with turnbuckle ends. 99c
On reels in any length ea.
3/32 ..... 4c Ft. 3/16 ..... 8c Ft.
1/8 ..... 4½c Ft. 9/32 ..... 8c Ft.
5/32 ..... 5c Ft.

Action METAL SNIPS

Hard steel blades. Expansion spring. Locking device. Right Hand and Left Hand $2.59

SPRING MIX

Torsion, compression and tension springs. Assorted sizes. #206 2 lbs. 89c
A treasure shelf for emergencies!

BEARING MIX

#170
Needle, ball and roller bearings in excellent assortment. Sizes from 1/2" to 2".
Introducing this treasure shelf assortment of 15 Bearings at $2.95

HOBBYISTS!

#106
An Unequalled Value! GADGET MIX Rivets, spacers, Clamps, bolts, nuts, Radio parts, gears, etc.
A gold mine ..... 5 lbs. $1.19

RUBBER GOODS

NEOPRENE SHEET RUBBER

	Thickness	Approx. Width	Approx. Length	Price per sq. ft.
#323	.015"	1/64	36"	.60
#325	.020"	1/64	36"	.75
#326	.037"	1/32	36"	1.00
#327	.064"	1/16	36"	1.75
#328	.175"	3/16	42"	6.00

PLASTIC PARALLEL STRAIGHT EDGE

#PA-1
with knobs & rubber pads for non slippage on each section. A must for navigators, mechanics, draftsmen, Engineers ... You've never seen 'em at ..... 97¢ ea.

ORDER DIRECT FROM THIS AD
FREE - LARGE ILLUSTRATED CATALOGUE

All sales final. Make remittances by money-order, bank draft or personal check. Purchase orders acceptable from D & B firms. All quotations F. O. B. Los Angeles. Send ½ deposit with C. O. D. orders. Also Complete Aircraft Supplies

PALLEY SUPPLY CO. THE LARGEST FIRM OF ITS TYPE IN THE WORLD

DEPT. P. S. 38 — 6321 SAN FERNANDO RD. GLENDALE 1, CALIFORNIA

"I saved $150.00 BY INSTALLING MY OWN DELTA OIL BURNER"

"Yes, sir! I saved $150.00 when I installed my Delta Oil Burner myself in a few hours. I shopped around but couldn't get a burner installed for less than $350.00. The work was easy because of the Delta Photo-Installation Manual . . ."

MADE BY THE WORLD'S LARGEST MANUFACTURER OF OIL BURNERS

Now you can enjoy *fully automatic* heat in your home by installing it *yourself* simply and quickly with a few tools. You can save at least $150.00 in your spare time! The Delta Automatic Oil Burner comes completely assembled along with *everything* necessary for the complete installation by you for the low price of only **$195.00.** Includes the famous copyrighted DELTA PHOTO-INSTALLATION MANUAL showing step-by-step photographs of an actual installation. **PAY AS LITTLE AS $6.26 A MONTH!** And—you need not pay a single penny to get the Delta Automatic Oil Burner because a simple deferred payment plan is available. Just send the coupon below for full information and free brochure in color describing how you can install and enjoy *fully automatic* heat in your home with the Delta Automatic Oil Burner, Delta Automatic Floor Furnace, and other Delta Heating products. *Mail coupon today!*

—PASTE COUPON ON PENNY POSTCARD—

DELTA HEATING CORPORATION
85-07 Northern Blvd., Jackson Heights, New York City

Please send FREE Color Brochure and full information about Delta Heating products.

NAME.....

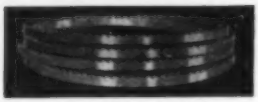
ADDRESS.....CITY.....
(Please Print Clearly) PS-M

Say You Saw It In Popular Science

Electrically Welded Endless

Paramount

BAND SAW BLADES



Made in widths from 1/8" to 1-3/4"

Make your band saw do more work for you. The proper width of blade will extend the scope of this important machine. Burrill's Paramount Blades are made from tough Nickel Alloy Steel properly tempered. Teeth accurately set and filed, and all saws carefully straightened. Send order and check today. Delivery will be made as promptly as conditions permit, from a few days to a week or two. You can obtain these saws at the following prices:

⅛"-3/16"-¼"-⅜" wide, 5'6" long.....$1.04 each
⅛"-3/16"-¼"-⅜" wide, 6'6" long.....$1.16 each
⅛"-3/16"-¼"-⅜" wide, 7'6" long.....$1.27 each

Other sizes at proportional prices

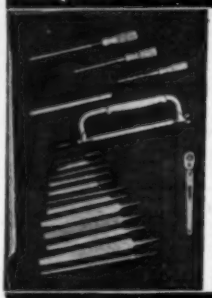
NO C.O.D. SHIPMENTS ACCEPTED

State Make of Machine

Your satisfaction is guaranteed

BURRILL SAW & TOOL WORKS
405 E. Main St., Ilion, N.Y.

Surplus Hardware BARGAINS



3 Phillips Screwdrivers #2, 3 & 4 **$1.10 set**

High Speed Hacksaw Blades, Hand Type, Molybdenum Steel, 10 in. 32 Teeth .....**$1.30 dz.**

Hack Saw Frames, Adjustable. Mfg. by Union Hardware.....**$ .80 ea.**

Roll-Up Tool Kit, Browndnck, 26" x 52"—49 Pockets .....**$1.50 ea.**

12 Assorted American Standard Files, 4" to 12", Popular Brands **$2.35 set**

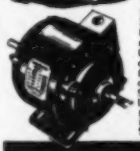
Reversible Ratchet Wrench, ½" Sq. Drive x 10" Long, Mfg. by Duro-Chrome .....**$3.20 ea.**

Order Today—We Pay the Postage!

INDUSTRIAL SUPPLY COMPANY | **312 EAST 33rd ST. NEW YORK 16, N. Y.**

ELECTRIC MOTOR BARGAINS!

1/20 HP GENERAL ELECTRIC or WESTINGHOUSE MOTOR, 110V-AC, Easily installed on oil burners, refrigerators, benches, small compressors, pumps, saws, etc. Quiet-running, economical, excellent for application where high-starting torque not a requisite. Resilient mounted. **Your Low Cost.....$19.00**



1/3 HP 110 V-AC DOUBLE END SHAFT ALL PURPOSE MOTOR. Ball bearings lubricated. Double sealed for lifetime. *Never needs oiling!* Excellent for bench grinders, buffing, etc. Streamlined for beauty and efficiency. **Amazingly Priced at $26.00.**

JAR OF 1000 USES Half-gallon Duraglas Dispenser suited for many uses about the shop, garage, farm. May be used as a man-sized liquid or powder soap dispenser, fuel container for oil cook stove, poultry water container, etc. Orders filled while they last! **ONLY 50c each.**

Send full amount—we pay postage or 25% deposit, balance C. O. D.

ROBERT-BENJAMIN CO.
443 WASHINGTON STREET
NEWARK NEW JERSEY

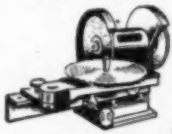
Draw any size Stars quickly and accurately. Attractive, durable 8½" X 4", suitable for advertising. Postpaid 25c each, 5 for $1., quantity prices on request. **A. C. HUBBELL, 401 East 3rd St., Long Beach 12, California.**

RELEASE the Full Power of YOUR MIND

Send for free booklet telling how you can achieve success and reach your personal goals. Find out how to remove frustrations, inferior feelings and worry thru PSYCHO-MENTALISM. Learn how to make your subconscious mind work *for*, not against, you. Write today. No obligation. **PSYCHO-MENTALIST INSTITUTE, Administration Building, Dept. 8-C Covina, California**

REYNOLDS CIRCULAR SAW GRINDER

Increases Your Profits!



FOR
JOINTING
GUMMING
SHARPENING

SAWS 5"-30"

WRITE FOR CIRCULAR

REYNOLDS MACHINERY CO.
305 EDDY STREET, PROVIDENCE 3, R. I.

Paint Your Own Car in *One Hour* with the NEW AUTO ENAMEL

YOU WIPE ON *Like Magic* with only a POWDER PUFF

2 YEAR *Guarantee* LUSTR WIPE

TRADE MARK

Dries in about one hour to smooth, mirror-like professional finish.

GUARANTEED FOR 2 YEARS not to crack, chip, peel or fade, if simple directions are followed. Lustr-Wipe is NOT a wax or a polish but a marvelous new Auto Enamel.

NO Brushing
NO Spraying
NO Masking
NO Streaks

Follow the simple instructions and LUSTR-WIPE will give your car that new FACTORY-LOOK. Dries dust-free in about an hour. Goes over any color, enamel or lacquer.

ONE QUART PAINTS YOUR ENTIRE CAR ANYONE CAN DO A BEAUTIFUL JOB

LUSTR-WIPE is the easy, speedy, economical, yet most successful way you've ever seen to PAINT YOUR OWN CAR. It's different-works almost like magic! All you need is ONE QUART of LUSTR-WIPE, the Miracle Auto Enamel, and the powder puff we send you AT NO EXTRA COST. Almost ANYONE, can do a magnificent job in about ONE SHORT HOUR. It seems unbelievable but true. JUST WIPE IT ON. No brush needed. No spray required. No masking of any kind. LUSTR-WIPE dries dust-free in about an hour. You'll be amazed—thrilled beyond words with the results! Your friends will think you spent $75 to $125 for a professional paint job. YOUR CAR WILL LOOK "LIKE NEW". Rush your order for a quart of LUSTR-WIPE TODAY.

This Price for Immediate Delivery

SAVE by Ordering NOW! **$3.95 PER QUART**

ORDER ONE OR MORE QUARTS TODAY

Applicator Furnished

SEND NO MONEY! ORDER LUSTR-WIPE TODAY!

BLACK or GREY (Gunmetal Grey-Dark, Air Wing Grey-Light)	$3.95 per Qt.
GREEN (Brewster-Dark or Jewel-Light)	3.95 per Qt.
BLUE (Washington-Dark or Monticello-Light)	3.95 per Qt.
SUN BEIGE (Tan)	3.95 per Qt.
RED or MAROON	3.95 per Qt.

Order one quart or more today! SEND NO MONEY! Mail penny postcard. Then pay postman for LUSTR-WIPE plus postal charges. Or, if you send money with order, WE pay postage. See your dealer or order direct.

Send for free details of powerful money-making plan. Why wait? The weather is ideal for painting cars. START NOW BY ORDERING ONE OR MORE QUARTS OF LUSTR-WIPE TODAY!

LUSTR-WIPE CORP. 166 W. Washington, Dept. C, Chicago 2, Ill.

Please send me_____quarts of LUSTR-WIPE AUTO ENAMEL at the special price of $3.95 per quart.

COLOR_____

☐ Send Postpaid. Full Payment $_____enclosed.

☐ Send C.O.D. plus Postal charges.

NAME_____

ADDRESS_____

CITY_____ ZONE____ STATE_____

☐ Send information regarding AGENT PLAN.

☐ Send information regarding DISTRIBUTORSHIP.

MAIL COUPON TODAY! SEND NO MONEY!

AGENTS WANTED FOR NEW MONEY-MAKING BUSINESS! CAN MAKE GROSS PROFITS UP TO $275.00 IN ONE WEEK.

Go into business for yourself selling LUSTR-WIPE in cans, or painting cars yourself or having others to do the work. Owners of old cars everywhere (who can't get new cars) are easy prospects. Send now for our MONEY-MAKING PLAN.

DISTRIBUTORS WANTED: A few wonderful territories now available. Write at once for our SPECIAL OFFER.

LUSTR-WIPE CORP. 166 W. Washington St. Dept. C. Chicago 2, Ill.

TO: Reader
FROM: Editor

You Don't Have To be Good To Have Fun!

IF YOUR job or hobby is deep-sea diving or jet-plane piloting, either you're good or you're dead. Watchmaking and diamond cutting call for considerable skill, too. But there are dozens of pursuits less exacting that offer something much needed these days: the thrill of accomplishment.

I have an idea that a lot of people hesitate over hobbies because (a) they think they aren't skilled enough, or (b) it's too much work.

For those who "can't drive a nail," I recommend a careful reading of Jerome Parker's lively piece on page 194, "I'm Proud of My All-Thumbs Craftwork." Not because Mr. Parker threatens Mr. Chippendale, but because he is himself an amateur with a hammer. And because he is able to pass along in print some of the sheer pleasure of making something out of nothing.

Some things need no blueprints, no fancy tools, no great skill. The personal production of even the most primitive gimmick has a thrill as a by-product. Let me tell you about MY operation . . .

Now, I can run a hammer, saw, paintbrush, and wrench, but I'm no Harry Walton. One stormy Sunday afternoon lately, I found myself with a restless six-year-old son who wanted a new belt like the beautiful hand-carved example of leathern art I had just picked up as a bargain. Rummaging around in my catch-all drawer, I found a half-inch leather strip, and an awl. Except for a little emergency sewing, and making a couple of crude holsters and sheaths years ago, I had never done any leather work.

But, probably by absorption from the pages of POPULAR SCIENCE, I knew you could wet leather, push it around with a blunt instrument, and thus impress a design. So, with my awl, a knife, a dull nail, and a kitchen spoon, I set to work—ably bothered by the boy.

Here's a picture of the result an hour later. It's a "school belt" complete with alphabet impressed by said nail. The "carving" was done with the handle of the spoon. I made mistakes: getting the leather too wet was the worst. It should be dampened from the flesh side until the polished side darkens. I now know. In my ignorant enthusiasm I soaked it good. It isn't going to put Sam Myers, down in Texas, out of the harness and holster business. But my son's schoolmates are pestering their pops.

And I guess it has put me in the leatherworking business. I never knew it was so much fun and so easy to turn pennies of leather into dollars of value compared to "boughten" stuff. So now I'm shopping for leatherworking tools.

In fact, if the fun isn't enough to start you doing something with your hands, the high prices these days are a good reason for making what you can yourself. You will find many things around the house, especially the little luxuries, that cost too much to buy. You can make them, even with the high cost of materials, for half the price and less. All you need is ten thumbs and the urge. And POPULAR SCIENCE will supply the urge.

PG

© 1948, Sealed Power Corp.

GET the same thrill from your old engine that it gave you when new—when it seemed to have wings! On some auto repair shop near you is this thermometer sign—the sign of your Sealed Power Franchised Dealer. Let him put new life in that old engine and save you a lot of money on gas and oil.

He has a set of Sealed Power Piston Rings specifically engineered to do the best possible job in your engine, whatever the make, model, or cylinder wear condition. When he gets through installing these rings, you'll thrill to that "new car feel" again.

Your Sealed Power Franchised Dealer uses Sealed Power Piston Rings because they are the best piston rings made, the choice of engine builders for 37 years. Sealed Power Ring Sets include the famous MD-50 Steel Oil Ring—THE ONLY RING WITH THE FULL FLOW SPRING.

Send a postal for illustrated, informative new booklet on 7 ways to save oil. It's free and may save you real money. Sealed Power Corporation, Dept. H3, Muskegon, Michigan. In Canada: Stratford, Ontario.

Your Sealed Power Franchised Dealer also handles Sealed Power Pistons, Cylinder Sleeves, Valves, Water Pumps and Chassis Parts.

Sealed Power
PISTON RINGS
BEST IN NEW CARS! BEST IN OLD CARS!

SOUTH BEND 10" *Precision Lathes*

The 10" Swing, 1" Collet Capacity South Bend Precision Lathe is engineered for the most exacting close-tolerance machine work. The direct belt drive to the carefully balanced spindle assembly provides smooth, vibration-free speeds up to 1357 r.p.m. Slow speeds for heavy cuts on large diameters are driven through back-gears. Full quick change gear equipment makes any of 48 different threads and 48 different feeds instantly available.

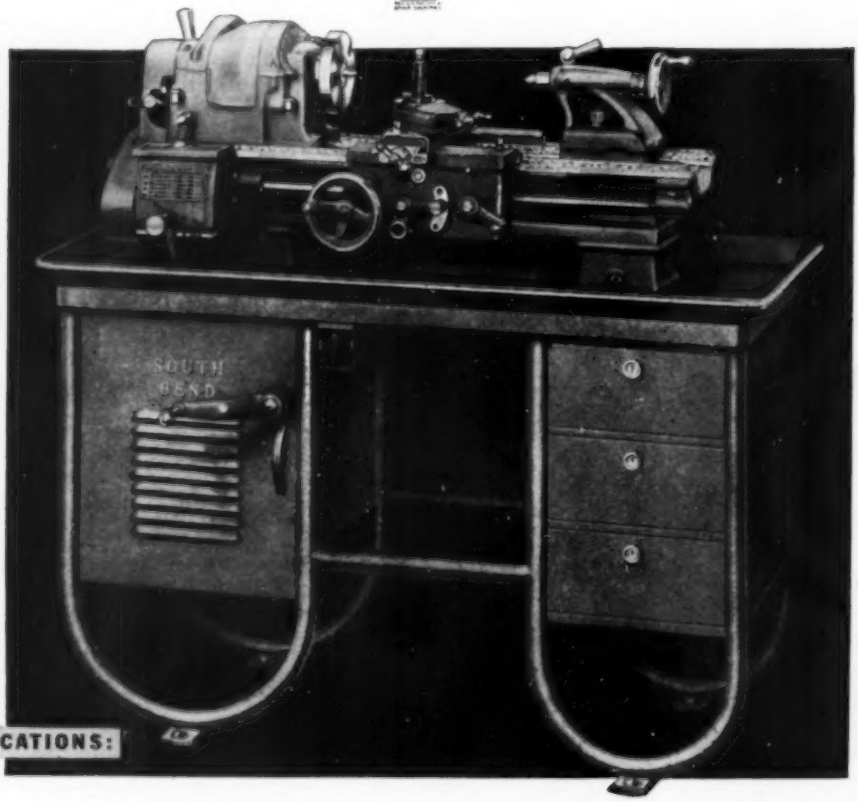
The precision, speed, and versatility of this lathe assures an efficient output on toolroom or manufacturing jobs. The 1⅜" bore through the head stock spindle makes it especially suited for machining parts from bar or tube stock. A complete line of practical attachments greatly simplifies tooling the lathe for a wide variety of operations.

South Bend Precision Lathes are made with 9", 10", 13", 14½", 16", and 16/24" swings. We also manufacture Turret Lathes with ½" and 1" maximum collet capacity, and 14" Precision Drill Presses. Immediate deliveries can be made and a Time Payment Plan is available.

SOUTH BEND LATHE WORKS

BUILDING BETTER TOOLS SINCE 1906

456 EAST MADISON ST., SOUTH BEND 22, INDIANA



SPECIFICATIONS:

Catalog No. 187-YS South Bend 10"-1" Collet capacity Quick Change Gear Bench Lathe illustrated. Price—f.o.b. factory with 3 ph., 60 cy., 220 v., A.C. motor; drum switch; and bench **$933.60**

SWINGS: 10⅛" over bed and saddle wings, 5¾" over saddle cross slide.

BED LENGTHS . . . 3, 3½, 4 and 4½ feet

CENTER DISTANCE . . 14⅜ to 32⅜ inches

COLLET CAPACITY . . . . . 1 inch

SPINDLE BORE . . . . . 1⅜ inches

12 SPINDLE SPEEDS . . 50 to 1357 r.p.m.

CROSS SLIDE TRAVEL . . . . . 5⅞"

COMPOUND REST TOP ANGULAR FEED: 2"

POWER LONGITUDINAL FEEDS: 48 R.H. or L.H. . . . . .0015" to .0836"

48 POWER CROSS FEEDS: .0006" to .0309"

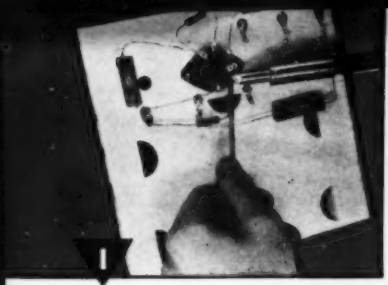
THREAD CUTTING: 48 R.H. or L.H. pitches . . . . . 2—224 per inch

PRICE RANGE OF SOUTH BEND 10" PRECISION LATHES

Quick Change Gear Lathes . . **$718 to $946**

Toolroom Lathes . . . . . **$994 to $1186**

These prices f.o.b. factory, less electrical equipment



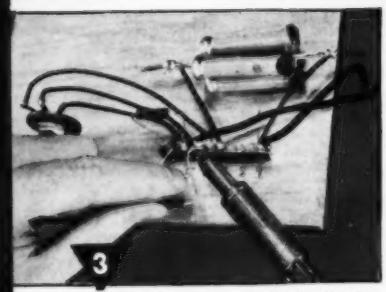
1

I send you Soldering Equipment and Radio Parts; show you how to do Radio Soldering, how to mount and connect Radio parts; give you practical experience.

2

Earl
to l
part
neig
EXT

Le
by

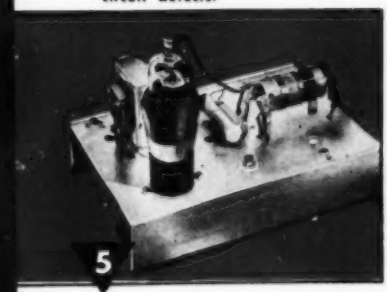


3

You get parts to build Radio Circuits; then test them; see how they work; learn how to design special circuits, how to locate and repair circuit defects.

4

You
Tub
whi
pac
rect



5

Building this A. M. Signal Generator gives you more valuable experience. It provides amplitude-modulated signals for many tests and experiments.

6

You
ceiv
dist
mor
succ

FIND OUT ABOUT T

SEE INSIDE

Be a RADIO Technician

I WILL TRAIN YOU AT HOME

Get sample Radio Lesson and 64-page book, "Be a Success in Radio," both FREE. See how I train you at home for good Radio jobs or your own Radio business. You learn by practicing with kits I send. Build Radio Tester, Superheterodyne Receiver, etc. Make $5, $10 a week EXTRA fixing Radios in spare time while learning. Course includes Television, Electronics. Mail post card NOW!

Cut out and Mail this Card

VETERANS: Approved Under G. I. Bill

BUSINESS REPLY CARD

No Postage Stamp Necessary If Mailed in The United States

4c POSTAGE WILL BE PAID BY

NATIONAL RADIO INSTITUTE,

16th and U Sts., N. W.,

Washington 9, D. C.

Dept. 8CP3

First Class

Permit No. 20-R

(Sec. 510, P.L.&R.)

Washington, D. C.

SOUTH BEND 10" *Precision Lathes*

The 10" Swing, 1" Collet Capacity South Bend Precision Lathe is engineered for the most exacting close-tolerance machine work. The direct belt drive to the carefully balanced spindle assembly provides smooth, vibration-free speeds up to 1357 r.p.m. Slow speeds for heavy cuts on large diameters are driven through back-gears. Full quick change gear equipment makes any of 48 different threads and 48 different feeds instantly available.

The precision, speed, and versatility of this lathe assures an efficient output on toolroom or

bar or tu
attachme
for a wi

South
10", 13",
manufact
mum co
Presses.
a Time

SOUT

456

SPECIFICATIONS:

Catalog No. 187-YS South Bend 10"-1" Collet capacity Quick Ch
Price—f.o.b. factory with 3 ph., 60 cy., 220 v., A.C. motor; drum

SWINGS: 10⅛" over bed and saddle wings, 5¾" over saddle cross slide.

BED LENGTHS . . . 3, 3½, 4 and 4½ feet

CENTER DISTANCE . . 14¾ to 32¾ inches

COLLET CAPACITY . . . . . 1 inch

SPINDLE BORE . . . . . 1⅛ inches

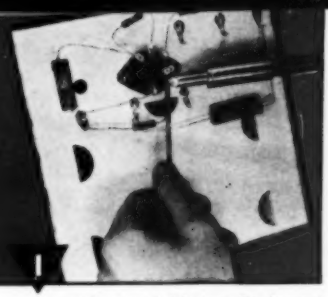
12 SPINDLE SPEEDS . . 50 to 1357 r.p

CROSS SLIDE TRAVEL 5

COMPOUND REST TOP ANGULAR FEED:

POWER LONGITUDINAL FEEDS: 48 R.H. L.H. . . . . .0015" to .083

48 POWER CROSS FEEDS: .0006" to .030



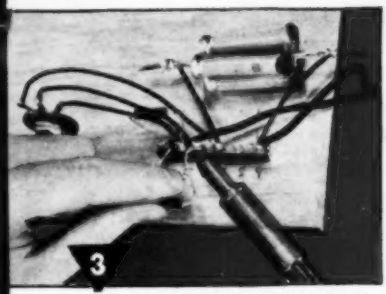
1

I send you Soldering Equipment and Radio Parts; show you how to do Radio Soldering, how to mount and connect Radio parts; give you practical experience.

2

Early in
to buil
parts I
neighb
EXTRA

Le
by P

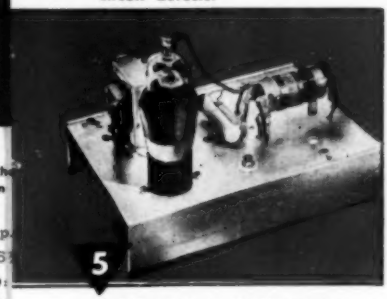


3

You get parts to build Radio Circuits; then test them; see how they work; learn how to design special circuits, how to locate and repair circuit defects.

4

You get
Tube P
which
packs o
rect pow



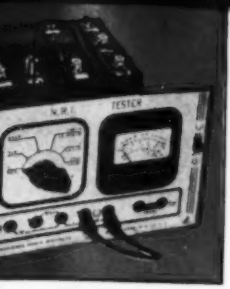
5

Building this A. M. Signal Generator gives you more valuable experience. It provides amplitude-modulated signals for many tests and experiments.

6

You buil
ceiver
distant
more ex
success

FIND OUT ABOUT TH



n my course I show you hew
ld this N. R. I. Tester with
send. It soon helps you fix
erhood Radios and earn
money in spare time.

VETERANS

You can get this training in your own home under G. I. Bill. Mail coupon for full details.

I TRAINED THESE MEN AT HOME

MADE $612, IN 12 MONTHS, SPARE TIME

"Soon after I finished my experimental kits lessons I tackled my first Radio service job. The neighbors were very cooperative. I soon had all the repair jobs I could handle in spare time. I have made $612 in the past 12 months in spare time."—J. W. CLARK, Wilmington, N. C.

MINISTER MAKES $10-$20 WEEKLY SPARE TIME

"I am a minister. I am in a county seat now trying to serve the people in my church, also trying to keep their Radios playing. I have been making from $10 to $20 per week in spare time."—L. H. SMITH, Benton, Tenn.

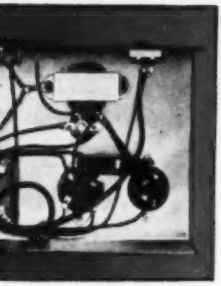
KNEW NOTHING ABOUT RADIO

"I knew nothing about Radio when I enrolled. At present I am doing spare time work. I have more than paid for my Course and I have about $200 worth of equipment which has paid for itself."—RAYMOND HOLTCAMP, Vandalia, Ill.

DOING GOOD SPARE TIME BUSINESS

"I have been getting receivers to repair right along lately, and by using the methods taught me in the NRI Course, I don't have to spend much time on any of them."—STANLEY N. STRICKLAND, 191 Dale Homes, Portsmouth, Va.

arn RADIO
PRACTICING in Spare Time



parts to build this Vacuum
ower Pack, make changes
give you experience with
f many kinds; learn to cor-
wer pack troubles.

d this Superheterodyne Re-
which brings in local and
stations—and gives you
perience to help you win
n Radio.

with BIG KITS of RADIO PARTS I send you

Do you want a good-pay job in the fast-growing Radio Industry—or your own Radio Shop? Mail post card at right for a Sample Lesson and my 64-page book, "How to Be a Success in RADIO," both FREE. See how I will train you at home—how you get practical Radio experience building, testing Radio circuits with BIG KITS OF PARTS I send.

Many Beginners Soon Make Extra Money in Spare Time While Learning

The day you enroll I start sending EXTRA MONEY manuals that show you how to make EXTRA money fixing neighbors' Radios in spare time while still learning! It's probably easier to get started in Radio now than ever before, because the Radio Repair Business is booming. Think of even *greater* opportunities as public demand for Television, FM and Electronic devices continues to grow. Cut out and mail post card for FREE books now!

Mail post card for Sample Lesson and FREE 64-page book. Read details about my Course, letters from men I trained: see how quickly, easily you can get started. No obligation! Just MAIL POST CARD NOW! **J. E. SMITH, President, Dept. 8CP3, National Radio Institute,** *Pioneer Home Study Radio School,* **Washington 9, D. C.**

Mail this Card for NEW 64 PAGE BOOK AND RADIO LESSON FREE

I will send you a FREE Lesson, "Getting Acquainted with Receiver Servicing," to show you how practical it is to train for Radio in spare time. It's a valuable lesson. Study it—keep it—use it—without obligation! Tells how "Superhet" Circuits work, gives hints on Receiver Servicing, Locating Defects, Repair of Loudspeaker, I. F. Transformer, Gang Tuning Condenser, etc., 31 illustrations. Get your sample lesson FREE—mail Coupon NOW!

Mr. J. E. SMITH, President, Dept. 8CP3
National Radio Institute
Washington 9, D. C.

Mail me FREE, Sample Lesson and 64-page book. (No Salesman will call. Please write plainly.)

Age.....

Name.....

Address.....

City.....Zone.....

State.....

☐ Check if Veteran

IS TESTED WAY TO GOOD PAY

ALL OVER AMERICA . . . THE "CHOICE OF EXPERIENCE"!

More people are smoking CAMELS than ever before!

R. J. Reynolds Tob. Co., Winston-Salem, N. C.

Let your "T-Zone" tell you why!

• All over America, the story's the same! With smoker after smoker who has tried different brands of cigarettes, Camels are the "Choice of Experience"!

Try Camels in your "T-Zone" – that's T for Taste and T for Throat—and you'll see the reasons why! Compare Camels for rich, full flavor; for mild, cool smoking – and you'll agree with the millions of smokers who say that Camels suit them to a "T"!

According to a Nationwide survey:

MORE DOCTORS SMOKE CAMELS THAN ANY OTHER CIGARETTE

When 113,597 doctors from coast to coast were asked by three independent research organizations to name the cigarette they smoked, more doctors named Camel than any other brand!